JUGONNATH SUNKERSETT
PRESENTATION.

£. 90,000 for Audubon set

by GERALDINE KEEN

Sale Room Correspondent

Four volumes containing the 435 plates of Audubon's Birds of America were sold at Sotheby's yesterday for £.90,000 to Mr. Kenneth Nebenzahl, a Chicago book dealer. Times have changed since in the early years of the nineteenth century John James Laforest Audubon, the American naturalist and artist, failed to interest any American publishers in his ambitious project to produce a major fully illustrated work on the birds of America.

Hoping to fare better he came to England. The essential problem was to find an engraver prepared to work on the several hundred plates he projected and to find enough subscribers for the work, which was issued in parts. Both were happily found. The work took 11 years to publish, from 1827 to 1838, and by the end of the period the original 300 subscribers had dwindled to about 100.

This tremendously important and decorative work is thus extremely rare. Most sets are in public libraries; in other cases sets have been broken up and the plates sold separately.

This was one of the very few complete editions remaining in private hands, and was in unusually fine condition; the plates engraved in aquatint and coloured by hand had hardly suffered over the years. An extra point of interest was the addition of early states of 13 of the plates - early proofs before extra birds were added to the composition. Nevertheless the price was remarkable; a less distinguished set was sold for £.21,429 at Parke Bernet in New York in 1966.

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THE

BIRDS OF AMERICA,

FROM

DRAWINGS MADE IN THE UNITED STATES

AND THEIR TERRITORIES.

BY

JOHN JAMES AUDUBON, F. R. S., &c., &c.

57436

VOL. VI.

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V. G. AUDUBON.
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BIRDS OF AMERICA.

DRUMMOND'S SNIPE

SCOLOPAX DRUMMONDII, *Swains.*

(NOT FIGURED.)

"THIS SNIPE," according to Dr. RICHARDSON, whose account of it I copy, "is common in the Fur Countries up to latitude 65°, and is also found in the recesses of the Rocky Mountains. Its manners are in all respects similar to those of the European Snipes. It is intermediate in size between the *Sc. major* and *gallinago;* it has a much longer bill than the latter, and two more tail-feathers. Its head is divided by a pale central stripe, as in *Sc. gallinula* and *major;* its dorsal plumage more distinctly striped than that of the latter; and the outer tail-feather is a quarter of an inch shorter than that of *S. Douglassi.*

SCOLOPAX DRUMMONDII, *Drummond's Snipe*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 400.

DRUMMOND'S SNIPE, *Scolopax Drummondii*, Aud. Orn. Biog., vol. v. p. 319.

"Fur Countries to lat. 55°. Rocky Mountains."

"Description of a specimen killed on the Rocky Mountains. Colour:—*Dorsal plumage* and wings mostly brownish-black; the top of the head, scapulars, interscapulars, intermediate coverts, posterior greater ones, and tertiaries, reflecting green and mottled, or barred with yellowish-brown; this colour also forming stripes from the forehead to the nape, over the eyes to the sides of the neck, and more broadly on the exterior edges of the scapu-

lars and interscapulars. Middle dorsal plumage and first quill fringed with white, and most of the wing-coverts and lesser quills tipped with the same. Shafts of the primaries deep brown; an inch of the first near its point whitish. Rump and tail-coverts rich greenish-black, with reddish-orange or ferruginous ends, crossed by a blackish subterminal line, and tipped with white; the three exterior pairs barred alternately with clove-brown and brownish-white, the white tips broader; the two intermediate pairs coloured nearly like the middle ones, but partly barred and tipped with white. *Under plumage.* A dark brown stripe on the lores, another under the ear. Sides of the head, front of the neck and breast pale wood-brown, with central spots of dark umber; the flanks, insides of the wings, and under tail-coverts, barred with black and white, which on the latter is tinged with brown. Belly white. Bill blackish towards its tip, dark wood-brown at the base.

"Form typical; one small fold of the epidermis at the upper base of the bill; tail rather long, graduated, the feathers decreasing a little in breadth as they are more exterior.

"Length to end of tail 11½ inches; tail $2\frac{10}{12}$; wing $5\frac{3}{8}$; bill above $2\frac{7}{12}$, rictus $2\frac{9}{12}$; bare part of tibia $\frac{5}{12}$; tarsus $1\frac{3}{12}$; middle toe $1\frac{3}{12}$, its nail $\frac{3}{12}$; inner toe $\frac{11}{12}$; hind toe $\frac{4}{12}$, its nail $\frac{1}{12}$."

RED-BREASTED SNIPE.

SCOLOPAX NOVEBORACENSIS, *Gmel.*

PLATE CCCLI.—ADULT IN SUMMER AND WINTER.

On our arrival at the mouths of the Mississippi, on the first of April, 1837, I observed large flocks of this species on their way eastward. They were still in their winter plumage, and it was pleasing to see in how short a period that garb was changed, as we had opportunities of observing during our progress. At Grande Terre, on the 4th, several having reddish feathers scattered over their lower parts were procured. On the 13th, at Cayo Island, the change of colour was very considerable in some specimens, which I found to be old birds, while the younger were quite grey above, and white beneath. At Derniere Isle on the 16th, several were shot in as fine plumage

Red-breasted Snipe

1. Spring Plumage 2. Winter

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T. Bowen Phalad.a

as that represented in my plate, and few, even of the younger birds, were without some of the markings peculiar to the summer dress. Their numbers were exceedingly great, and continued without diminution until we reached Galveston Bay in Texas, on the 26th of the same month. How far they proceed beyond that place to spend the winter I am unable to say; but their range over North America is known to be very extensive, as they have been found on the Columbia river on the western coast, on the borders of the great northern lakes, and over the whole extent of the Fur Countries, from the time of their appearance in spring until that of their return southward in autumn.

Although much more abundant along the coast, and in its vicinity, the Red-breasted Snipe is not uncommon in many parts of the interior, especially in autumn, and I have procured many individuals along the muddy margins of lakes, more than three hundred miles in a direct line from the sea. Its migratory movements are performed with uncommon celerity, as many are observed along the coast of New Jersey early in April, and afterwards on the borders of the arctic sea, in time to rear young, and return to our Eastern and Middle Districts before the end of August.

This bird exhibits at times a manner of feeding which appeared to me singular, and which I repeatedly witnessed while at Grande Terre in Louisiana. While watching their manner of walking and wading along sand-bars and muddy flats, I saw that as long as the water was not deeper than the length of their bills, they probed the ground beneath them precisely in the manner of the American Snipe, *Scolopax Wilsoni;* but when the water reached their bodies, they immersed the head and a portion of the neck, and remained thus sufficiently long to satisfy me that, while in this position, they probed several spots before raising their head to breathe. On such grounds as are yet soft, although not covered with water, they bore holes as deep as the soil will admit, and this with surprising rapidity, occupying but a few moments in one spot, and probing as they advance. I have watched some dozens at this work for half an hour at a time, when I was completely concealed from their view. Godwits, which are also borers, probe the mud or moist earth often in an oblique direction, whilst the Woodcock, the Common Snipe, and the present species, thrust in their bills perpendicularly. The latter bird also seizes many sorts of insects, and at times small fry, as well as the seeds of plants that have dropped into the water. Dr. RICHARDSON informs us that "individuals killed on the Saskatchewan plains had the crops filled with leeches and fragments of coleoptera."

The flight of this bird is rapid, strong, and remarkably well-sustained. When rising in large numbers, which they usually do simultaneously, they

crowd together, are apt to launch upwards in the air for awhile, and after performing several evolutions in contrary directions, glide towards the ground, and wend their way close to it, until finding a suitable place, they alight in a very compact body, and stand for a moment. Sometimes, as if alarmed, they recommence their meandering flight, and after awhile return to the same spot, alighting in the same manner. Then is the time when the gunner may carry havoc amongst them ; but in two or three minutes they separate and search for food, when you must either put them up to have a good shot, or wait the arrival of another flock at the same place, which often happens, for these birds seldom suffer any of their species to pass without sending them a note of invitation. It is not at all uncommon to shoot twenty or thirty of them at once. I have been present when 127 were killed by discharging three barrels, and have heard of many dozens having been procured at a shot. When wounded and brought to the water, they try in vain to dive, and on reaching the nearest part of the shore, they usually run a few steps and squat among the grass, when it becomes difficult to find them. Those which have escaped unhurt often remain looking upon their dead companions, sometimes waiting until shot at a second time. When they are fat, they afford good eating, but their flesh is at no time so savoury as that of the common American Snipe.

The cry of this species when on wing is a single and rather mellow *weet*. When on the ground I have heard them emit a continued guttural rolling sound, such as is on certain occasions given out by the species last mentioned. Their call note resembles the soft and pleasing sound of a whistle ; but I have never heard them emit it while travelling. Nothing is known respecting their breeding, and yet there can be little doubt that many of them must rear young within the limits of the Union.

By the Creoles of Louisiana the Red-breasted Snipe is named " Becassine de Mer," as well as " Carouk." In South Carolina it is more abundant in the autumnal months than in spring, when I should think they fly directly across from the Floridas towards Cape Hatteras, as my friend Dr. BACHMAN informs me that he never saw one of them in spring in the vicinity of Charleston.

RED-BREASTED SNIPE, *Scolopax noveboracensis*, Wils. Amer. Orn., vol. vii. p. 48.

SOLOPAX GRISEA, Bonap. Syn., p. 330.

SCOLOPAX NOVEBORACENSIS, *New York Godwit*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 398.

BROWN OR RED-BREASTED SNIPE, Nutt. Man., vol. ii. p. 181.

RED-BREASTED SNIPE, *Scolopax noveboracensis*, Aud. Orn. Biog., vol. iv. p. 285.

Adult, 10¼, 18½.

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RED-BREASTED SNIPE, *Scolopax noveboracensis*, Aud. Orn. Biog., vol. iv. p. 285.

Adult, 10¼, 18½.

Passes in immense numbers from Texas eastward and northward to the highest latitudes, where it breeds, and returns in autumn. Occasionally seen in groups through the interior. Columbia river.

Adult Male in summer.

Bill twice as long as the head, subulate, straight, compressed for more than half its length, depressed towards the end. Upper mandible with the dorsal line declinate at the base, then straight, at the end slightly arched, that part being considerably enlarged, the ridge convex, towards the end flattened, the sides with a narrow groove extending to near the tip, the edges soft and obtuse or flattened, the tip narrowed but blunt. Nostrils basal, linear, very small. Lower mandible with the angle extremely long and narrow, the sides nearly erect, with a longitudinal groove, the edges flattened and directly meeting those of the upper mandible, the extremity enlarged, the tip contracted and rather blunt.

Head rather small, oblong, narrowed anteriorly, the forehead elevated and rounded. Neck rather short. Body rather full. Legs of moderate length, slender; tibia bare below, scutellate before and behind; tarsus with numerous scutella before, smaller ones behind, and reticulated sides; toes very slender, free, with numerous scutella above, flattened and slightly marginate beneath; first very small and elevated, third with its claw scarcely so long as the tarsus, lateral toes nearly equal, the outer connected with the middle by a web. Claws small, slightly arched, compressed, rather acute.

Plumage very soft, blended, rather dense, on the fore part of the head very short. Wings long, narrow, pointed; primaries rather broad, tapering to an obtuse point, the first longest, the rest rapidly graduated; secondaries broad, obliquely terminated, with the inner web projecting beyond the outer; the inner much elongated, one of them reaching to half an inch of the tip of the wing when it is closed. Tail moderate, nearly even, the middle feathers a little longer, of twelve rounded feathers.

Bill dark olive. Iris reddish-hazel. Feet light yellowish-olive, claws black. Upper parts brownish-black, variegated with light brownish-red, the feathers being margined and the scapulars obliquely barred with that colour. Hind part of back, upper tail-coverts and tail-feathers light reddish-buff, obliquely barred with black, the bars on the tail seven or eight, and its tip white. Wing-coverts and secondaries greyish-brown, margined with greyish-white; the secondary coverts tipped with white, the quills tipped and obliquely banded with the same; alula, primary coverts and quills brownish-black, the shaft of the first quill white. From the base of the bill to the eye, and surrounding it, a dull reddish-white band; loral space dusky. All the lower parts dull orange-red, with streaks and spots of black, more numerous along the sides, and on the tail-coverts.

Length to end of tail 10¼ inches, to end of wings 10, to end of claws 11½; extent of wings 18⅛; wing from flexure 6⅛; tail 2½; bill along the ridge 2⅛; along the edge of lower mandible 2⅛; bare part of tibia ½; tarsus 1⅜; middle toe and claw 1⅛; hind toe and claw ⅜; inner toe and claw 1; outer toe and claw ⅞. Weight 3¼ oz.

Adult in winter.

The bill, iris, and feet as in summer. Upper part of head and hind neck dusky grey, with which the feathers of the fore part of the back, scapulars and wing-coverts are margined, their central parts being brownish-black. A white band from the bill over the eye; margins of eyelids also white. Hind part of back and tail barred with dusky as in summer. Quills as in summer, the inner marked with grey in place of brownish-red. Loral space, cheeks, and sides of the neck, pale grey; throat and lower parts white; the sides, axillary feathers, and lower tail-feathers, barred with dusky; lower wing-coverts dusky, edged with white, and having a central streak of the same. Individuals exhibit great differences in the length of the bills and tarsi.

On the upper mandible internally are three series of minute papillæ, which become larger on the palate. While the upper mandible is flat beneath, the lower is deeply concave, and its crura elastic and capable of being separated near the base to the distance of three-fourths of an inch. The tongue, which is 2¼ inches long, and of a slender form, carinate beneath, with the tip pointed, lies in the deep hollow of the lower mandible, and being deeply concave above, leaves a vacant space, by which, when the bill is immersed in the mud and the tips separated, the food passes along. The œsophagus is 4¼ inches long, ¼ inch in diameter, and nearly uniform. The proventriculus, *a*, *b* *c*, is bulbiform, its diameter 6 twelfths. The stomach, *c*, *d*, *e*, *f*, is an oblong gizzard of moderate strength, with the lateral and inferior muscles decided, the tendons large, its length 1 inch, its breadth 8 twelfths. The epithelium is dense, tough, with numerous longitudinal rugæ, and of a reddish colour. The contents of the stomach were very small hard hemispherical seeds and vegetable fibres. The intestine, *f*, *g*, *h*, 19½ inches long, its diameter 3 twelfths in its upper part; the cæca 1⅜ inches long, and from 1 to 2 twelfths in diameter, with the extremity obtuse.

The trachea is wide, flattened, 3½ inches long, 2¾ twelfths broad at the top, gradually diminishing to 2 twelfths; the rings about 130. The contractor muscles are very thin, the sterno-tracheal slender; and there is a pair of inferior laryngeal. The bronchial half rings are about 25.

Nº 71.
Pl. 352.
2
1.
3.
American Woodcock
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
1. Male, 2. Female, 3. Young in Autumn.
Lith.d Printed & Col.d by J. T. Bowen, Pa. Ind.a

GENUS VII.—MICROPTERA, *Nutt.* WOODCOCK OR BOGSUCKER.

Bill double the length of the head, straight, slender, tapering, sub-trigonal, and deeper than broad at the base, slightly depressed towards the end; upper mandible with the ridge narrow, towards the end flattened, the sides with a narrow groove extending to near the tip, the tip blunt, knob-like, and longer than that of the lower. Head rather large, oblong; eyes large, and placed high; neck short; body full. Feet rather short; tibia feathered to the joint; tarsus rather short, compressed, scutellate; first toe very small, the third much longer than the tarsus. Claws very small, arched, acute. Wings short, rounded, the fourth and fifth quills longest, the first three extraordinarily attenuated. Tail very short, cuneate, of twelve feathers.

THE AMERICAN WOODCOCK, OR BOGSUCKER.

MICROPTERA AMERICANA, *Aud.*

PLATE CCCLII.—MALE, FEMALE, AND YOUNG.

There is a kind of innocent simplicity in our Woodcock, which has often excited in me a deep feeling of anxiety, when I witnessed the rude and unmerciful attempts of mischievous boys, on meeting a mother bird in vain attempting to preserve her dear brood from their savage grasp. She scarcely limps, nor does she often flutter along the ground, on such occasions; but with half extended wings, inclining her head to one side, and uttering a soft murmur, she moves to and fro, urging her young to hasten towards some secure spot beyond the reach of their enemies. Regardless of her own danger, she would to all appearance gladly suffer herself to be seized, could she be assured that by such a sacrifice she might ensure the safety of her brood. On an occasion of this kind, I saw a female Woodcock lay herself

down on the middle of a road, as if she were dead, while her little ones, five in number, were endeavouring on feeble legs to escape from a pack of naughty boys, who had already caught one of them, and were kicking it over the dust in barbarous sport. The mother might have shared the same fate, had I not happened to issue from the thicket, and interpose in her behalf.

The American Woodcock, although allied to our Common Snipe, *Scolopax Wilsonii*, differs essentially from it in its habits, even more than in form. The former is a much gentler bird than the latter, and although both see at night, the Woodcock is more nocturnal than the Snipe. The latter often, without provocation or apparent object, migrates or takes long and elevated flights during the day; but the Woodcock rarely takes flight at this time, unless forced to do so to elude its enemies, and even then removes only to a short distance. When rambling unconcernedly, it rarely passes high above the tree tops, or is seen before the dusk or after the morning twilight, when it flies rather low, generally through the woods; and its travels are altogether performed under night. The largeness of its eyes, as compared with those of the Snipe, might of itself enable one to form such a conclusion; but there is moreover a difference in the habits of the Woodcock and Snipe, which I have been surprised at not finding mentioned by WILSON, who certainly was an acute observer. It is that the Woodcock, although a prober of the mire, frequently alights in the interior of extensive forests, where little moisture can be seen, for the purpose of turning up the dead leaves with its bill, in search of food beneath them, in the manner of the Passenger Pigeon, various Grakles, and other birds. This the Snipe, I believe, has never been observed to do. Indeed, although the latter at times alights on the borders of pools or streams overhung by trees, it never flies through the woods.

The American Woodcock, which in New Brunswick is named the Bog-sucker, is found dispersed in abundance during winter over the southern parts of the Union, and now and then, in warm and sequestered places, even in the Middle Districts. Its stay in any portion of the country at this period, seems to depend altogether on the state of the weather. In the Carolinas, or even in Lower Louisiana, after a night of severe frost, I have found their number greatly diminished in places where they had been observed to be plentiful the day before. The limits of its northern migrations at the commencement of the breeding season, are yet unascertained. When in Newfoundland I was assured that it breeds there; but I met with none either in that country or in Labrador, although it is not rare in the British Provinces of New Brunswick and Nova Scotia during summer. From the beginning of March until late in October, this bird may be found in every district of the Union that affords places suited to its habits; and its numbers, I am per-

suaded, are much greater than is usually supposed. As it feeds by night, it is rarely met with by day, unless by a sportsman or gunner, who may be engaged in pursuing it for pleasure or profit. It is, however, killed in almost incredible numbers, from the beginning of July until late in winter, in different parts of the Union, and our markets are amply supplied with it during its season. You may at times see gunners returning from their sports with a load of Woodcocks, composed of several dozens; nay, adepts in the sport have been known to kill upwards of a hundred in the course of a day, being assisted by relays of dogs, and perhaps a change of guns. In Lower Louisiana, they are slaughtered under night by men carrying lighted torches, which so surprise the poor things that they stand gazing on the light until knocked dead with a pole or cane. This, however, takes place only on the sugar and cotton plantations.

At the time when the Woodcocks are travelling from the south towards all parts of the United States, on their way to their breeding places, these birds, although they migrate singly, follow each other with such rapidity, that they might be said to arrive in flocks, the one coming directly in the wake of the other. This is particularly observable by a person standing on the eastern banks of the Mississippi or the Ohio, in the evening dusk, from the middle of March to that of April, when almost every instant there whizzes past him a Woodcock, with a velocity equalling that of our swiftest birds. See them flying across and low over the broad stream; the sound produced by the action of their wings reaches your ear as they approach, and gradually dies away after they have passed and again entered the woods. While travelling with my family, in the month of October, through New Brunswick and the northern part of the State of Maine, I saw the Woodcocks returning southward, in equal numbers late in the evenings, and in the same continuous manner, within a few yards or even feet of the ground, on the roads or through the woods.

This species finds itself accommodated in the warmer parts of the United States, as well as in high northern latitudes, during the breeding season: it is well known to reproduce in the neighbourhood of Savannah in Georgia, and near Charleston in South Carolina. My friend JOHN BACHMAN has known thirty young ones, not yet fully fledged, to have been killed in the vicinity of the latter place in one day. I have never found its nest in Louisiana, but I have frequently fallen in with it in the States from Mississippi to Kentucky, in which latter country it breeds abundantly. In the Middle Districts, the Woodcock begins to pair in the end of March; in the southern, a month earlier. At this season, its curious spiral gyrations, while ascending or descending along a space of fifty or more yards of height, in the manner described in the article on the Snipe, when it utters a note dif-

ferent from the cry of that bird, and somewhat resembling the word *kwauk*, are performed every evening and morning for nearly a fortnight. While on the ground, at this season, as well as in autumn, the male not unfrequently repeats this sound, as if he were calling to others in his neighbourhood, and on hearing it answered, immediately flies to meet the other bird, which in the same manner advances toward him. On observing the Woodcock while in the act of emitting these notes, you would imagine he exerted himself to the utmost to produce them, its head and bill being inclined towards the ground, and a strong forward movement of the body taking place at the moment the *kwauk* reaches your ear. This over, the bird jerks its half-spread tail, then erects itself, and stands as if listening for a few moments, when, if the cry is not answered, it repeats it. I feel pretty confident that, in spring, the female, attracted by these sounds, flies to the male; for on several occasions I observed the bird that had uttered the call immediately caress the one that had just arrived, and which I knew from its greater size to be a female. I am not, however, quite certain that this is always the case, for on other occasions I have seen a male fly off and alight near another, when they would immediately begin to fight, tugging at and pushing each other with their bills, in the most curious manner imaginable.

The nest, which is formed of dried leaves and grass, without much apparent care, is usually placed in some secluded part of the woods, at the foot of some bush, or by the side of a fallen trunk. In one instance, near Camden, in New Jersey, I found one in a small swamp, on the upper part of a log, the lower portion of which was covered with water, to the height of several inches. The eggs, which are laid from February to the first of June, according to the latitude of the place selected, are usually four, although I have not very unfrequently found five in a nest. They average one inch and five and a half eighths in length, by one inch and an eighth in breadth, are smooth, of a dull yellowish clay colour, varying in depth, and irregularly but pretty thickly marked with patches of dark brown, and others of a purple tint.

The young run about as soon as they emerge from the shell. To my astonishment, I once met with three of them on the border of a sand-bar on the Ohio, without their parent, and to all appearance not more than half a day old. I concealed myself near them for about half an hour, during which time the little things continued to totter about the edge of the water, as if their mother had gone that way. During the time I remained I did not see the old bird, and what became of them I know not. The young birds are at first covered with down of a dull yellowish-brown colour, then become streaked with deeper umber tints, and gradually acquire the colours of the old. At the age of from three to four weeks, although not fully fledged, they are able to fly and escape from their enemies, and when they are six

weeks old, it requires nearly as much skill to shoot them on wing as if they were much older. At this age they are called *stupid* by most people; and, in fact, being themselves innocent, and not yet having had much experience, they are not sufficiently aware of the danger that may threaten them, when a two-legged monster, armed with a gun, makes his appearance. But, reader, observe an old cock on such occasions: there he lies, snugly squatted beneath the broad leaves of that "sconk cabbage" or dock. I see its large dark eye meeting my glance; the bird shrinks as it were within its usual size, and, in a crouching attitude, it shifts with short steps to the other side. The nose of the faithful pointer marks the spot, but unless you are well acquainted with the ways of Woodcocks, it has every chance of escaping from you both, for at this moment it runs off through the grass, reaches a clump of bushes, crosses it, and, taking to wing from a place toward which neither you nor your dog have been looking, you become flustered, take a bad aim, and lose your shot.

Thousands of persons besides you and myself are fond of Woodcock shooting. It is a healthful but at times laborious sport. You well know the places where the birds are to be found under any circumstances; you are aware that, if the weather has been for some time dry, you must resort to the damp meadows that border the Schuylkill, or some similar place; that should it be sultry, the covered swamps are the spots which you ought to visit; but if it be still lowering after continued rain, the southern sides of gentle hills will be found preferable; that if the ground is covered with snow, the oozy places visited by the Snipe are as much resorted to by the Woodcock; that after long frost, the covered thickets along some meandering stream are the places of their retreat; and you are aware that, at all times, it is better for you to have a dog of any kind than to go without a dog at all. Well, you have started a bird, which with easy flaps flies before you in such a way that if you miss it, your companion certainly will not. Should he, however, prove as unsuccessful as yourself, you may put up the bird once, twice, or thrice in succession, for it will either alight in some clump of low trees close by, or plunge into a boggy part of the marsh. As you advance towards him, you may chance to put up half a score more, and *stupid* though you should be, you must be a bad shot indeed if you do not bring some one of them to the ground. Aye, you have done it, and are improving at the sport, and you may be assured that the killing of Woodcocks requires more practice than almost any other kind of shooting. The young sportsman shoots too quick, or does not shoot at all, in both which cases the game is much better pleased than you are yourself. But when once you have acquired the necessary coolness and dexterity, you may fire, charge and fire

again from morning till night, and go on thus during the whole of the Woodcock season.

Now and then, the American Woodcock, after being pursued for a considerable time, throws itself into the centre of large miry places, where it is very difficult for either man or dog to approach it; and indeed if you succeed, it will not rise unless you almost tread upon it. In such cases I have seen dogs point at them, when they were only a few inches distant, and after several minutes seize upon them. When in clear woods, such as pine barrens, the Woodcock on being put up flies at times to a considerable distance, and then performs a circuit and alights not far from you. It is extremely attached to particular spots, to which it returns after being disturbed.

Its flight is performed by constant rather rapid beats of the wings, and while migrating it passes along with great speed. I am inclined to think its flight is greatly protracted, on account of the early periods at which it reaches Maine and New Brunswick:—I may be wrong, but I am of opinion that at such times it flies faster than our little Partridge. In proceeding, it inclines irregularly to the right and left at the end of every few yards; but when it has been put up after having settled for awhile, it rises as if not caring about you, and at a slow pace goes a few yards and alights again, runs a few steps and squats to await your departure. It is less addicted to wading through the water than the Snipe, and never searches for food in salt marshes or brackish places. Rivulets that run through thickets, and of which the margins are muddy or composed of oozy ground, are mostly preferred by it; but, as I have already said, its place of abode depends upon the state of the weather and the degree of temperature.

The food of the Woodcock consists principally of large earthworms, of which it swallows as many in the course of a night as would equal its own weight; but its power of digestion is as great as that of the Heron, and it is not very often that on opening one you find entire worms in its stomach. It obtains its food by perforating the damp earth or mire, and also by turning the dead leaves in the woods, and picking up the worms that lie beneath them. In captivity, Woodcocks very soon accustom themselves to feed on moistened corn meal, bits of cheese, and vermicelli soaked in water. I have seen some that became so gentle as to allow their owner to caress them with the hand. On watching several individuals probing mud in which a number of earthworms had been introduced, in a tub placed in a room partially darkened, I observed the birds plunge their bills up to the nostrils, but never deeper; and from the motion of the parts at the base of the mandibles, I concluded that the bird has the power of working their extremities so as to produce a kind of vacuum, which enables it to seize the worm at one end

and suck it into its throat before it withdraws its bill, as do Curlews and Godwits. The quickness of their sight on such occasions was put to the test by uncovering a cat placed in the corner of the room, at the same height above the floor as the surface of the mud which filled the tub, when instantly the Woodcock would draw out its bill, jerk up its tail, spread it out, leap upon the floor, and run off to the opposite corner. At other times, when the cat was placed beneath the level of the bird, by the whole height of the tub, which was rather more than a foot, the same result took place; and I concluded that the elevated position of this bird's eye was probably intended to enable it to see its enemies at a considerable distance, and watch their approach, while it is in the act of probing, and not to protect that organ from the mire, as the Woodcock is always extremely clean, and never shews any earth adhering to the feathers about its mouth.

How comfortable it is when fatigued and covered with mud, your clothes drenched with wet, and your stomach aching for food, you arrive at home with a bag of Woodcocks, and meet the kind smiles of those you love best, and which are a thousand times more delightful to your eye, than the savoury flesh of the most delicate of birds can be to your palate. When you have shifted your clothes, and know that on the little round table already spread, you will ere long see a dish of game, which will both remove your hunger and augment the pleasure of your family; when you are seated in the midst of the little group, and now see some one neatly arrayed introduce the mess, so white, so tender, and so beautifully surrounded by savoury juice; when a jug of sparkling Newark cider stands nigh; and you, without knife or fork, quarter a Woodcock, ah, reader!—But alas! I am not in the Jerseys just now, in the company of my generous friend EDWARD HARRIS; nor am I under the hospitable roof of my equally esteemed friend JOHN BACHMAN. No, reader, I am in Edinburgh, wielding my iron pen, without any expectation of Woodcocks for my dinner, either to-day or to-morrow, or indeed for some months to come.

SCOLOPAX MINOR, Gmel. Syst. Nat., vol. i. p. 661.
WOODCOCK, *Scolopax minor*, Wils. Amer. Orn., vol. vi. p. 40.
SCOLOPAX MINOR, Bonap. Syn., p. 331.
LESSER WOODCOCK, Nutt. Man., vol. ii. p. 194.
AMERICAN WOODCOCK, *Scolopax minor*, Aud. Orn. Biog., vol. iii. p. 474.

Male, 11, 16. Female, $11\frac{7}{12}$, $17\frac{1}{4}$.

Distributed throughout the country. Extremely abundant in the Middle and Eastern Districts, as well as in the interior, where it breeds, as far as Nova Scotia. Equally abundant in winter in the Southern States, though many migrate southward.

Adult Male.

Bill double the length of the head, straight, slender, tapering, sub-trigonal and deeper than broad at the base, slightly depressed towards the end. Upper mandible with the dorsal line straight, the ridge narrow, towards the end flattened, the sides nearly erect, sloping outward towards the soft obtuse edges, the tip blunt, knob-like, and longer than that of the lower mandible. Nostrils basal, lateral, linear, very small. Lower mandible broader than the upper, the angle very long and narrow, the dorsal line straight, the back broadly rounded, the sides marked with a broad groove, sloping inwards at the base, outwards towards the end, the edges soft and obtuse, the tip rounded.

Head rather large, oblong, narrowed anteriorly; eyes large, and placed high. Neck short and thick. Body rather full. Feet rather short; tibia feathered to the joint; tarsus rather short, compressed, anteriorly covered with numerous scutella, laterally and behind with sub-hexagonal scales, and having a row of small scutelliform scales along the outer side behind. Toes free, slender, the first very small, the second slightly shorter than the fourth, the third much longer and exceeding the tarsus in length; all scutellate above, marginate, flattish beneath. Claws very small, arched, acute, that of hind toe extremely small, of middle toe with a thin inner edge.

Plumage very soft, elastic, blended: of the fore part of the head very short, of the neck full. Wings short, rounded; the fourth and fifth quills about equal and longest, the first three extraordinarily attenuated, being in fact sub-linear, narrower beyond the middle, the inner web slightly enlarged towards the end, the first as long as the seventh; secondaries broad, the outer a little incurved and rounded, the inner tapering and elongated. Tail very short, wedge-shaped, of twelve narrow feathers, which taper towards the rounded point.

Bill light yellowish-brown, dusky towards the end. Iris brown. Feet flesh-coloured; claws brownish-black. The forehead is yellowish-grey, with a few dark mottlings in the centre; on the upper part of the head are two broad blackish-brown transverse bands, and on the occiput two narrower, separated by bands of light red; a brownish-black loral band, and a narrow irregular line of the same across the cheek and continued to the occiput. The upper parts are variegated with brownish-black, light yellowish-red, and ash-grey; there are three broad longitudinal bands of the first colour, barred with the second, down the back, separated by two of the last. The inner wing-coverts and secondary quills are similarly barred; the outer pale greyish-red, faintly barred with dusky. The quills are greyish-brown, tipped with dull grey, the secondaries spotted on the outer web with dull red. Upper tail-coverts barred; tail-feathers brownish-black, their tips grey, their

outer edges mottled with reddish. The sides of the neck are grey, tinged with red; the lower parts in general light red, tinged with grey on the breast, on the sides and lower wing-coverts deeper; the lower tail-coverts with a central dusky line, and the tip white.

Length to end of tail 11 inches, to end of wings $9\frac{1}{2}$; wing from flexure $5\frac{1}{4}$; tail $2\frac{4}{12}$; bill along the ridge $2\frac{8}{12}$, along the edge of lower mandible $2\frac{10}{12}$; tarsus $1\frac{2}{12}$; middle toe $1\frac{5}{12}$, its claw $\frac{1}{4}$. Weight $6\frac{1}{4}$ oz.

Adult Female.

The female, which is considerably larger, has the same colours as the male.

Length to end of tail $11\frac{7}{12}$, to end of wings $10\frac{5}{12}$, to end of claws $13\frac{4}{12}$; wing from flexure $5\frac{4}{12}$; tail $2\frac{4}{12}$; bill along the ridge $2\frac{9}{12}$; along the edge of lower mandible $2\frac{9}{12}$; tarsus $1\frac{2}{12}$; middle toe $2\frac{5}{12}$, its claw $\frac{1}{4}$. Weight $8\frac{1}{2}$ oz.

Young fledged.

The young, when fully fledged, is similar to the old female.

Genus VIII.—RECURVIROSTRA, *Linn.* AVOCET.

Bill twice the length of the head, very slender, much depressed, tapering to a point, and slightly recurved; upper mandible with the dorsal line straight for half its length, then a little curved upwards, and at the tip slightly decurved, the ridge broad and flattened, the edges rather thick; nasal groove rather long and very narrow; lower mandible with the angle long and very narrow, the dorsal line slightly curved upwards, the point very slender, extremely thin, and a little curved upwards. Nostrils linear, basal. Head small, rounded above, rather compressed; neck long; body compact. Legs very long, slender; tibia bare for half its length, and reticulated; tarsus very long, compressed, reticulated with hexagonal scales; toes rather short, the first extremely small; outer toe a little longer than inner; anterior toes connected by webs of which the anterior margin is deeply concave. Claws very small, compressed, rather acute. Plumage soft and blended. Wings long, pointed, the first quill longest; inner secondaries elongated and tapering. Tail short, even, of twelve rather narrow

rounded feathers. Tongue short in proportion to the length of the bill, slender, tapering to a point; œsophagus wide, considerably dilated at the lower part of the neck; stomach an oblong gizzard of moderate strength, its epithelium hard, longitudinally rugous; intestine long and of moderate width; cœca rather long.

AMERICAN AVOSET

RECURVIROSTRA AMERICANA, *Linn.*

PLATE CCCLIII.—ADULT MALE, AND YOUNG IN WINTER.

The fact of this curious bird's breeding in the interior of our country accidentally became known to me in June, 1814. I was at the time travelling on horseback from Henderson to Vincennes in the State of Indiana. As I approached a large shallow pond in the neighbourhood of the latter town, I was struck by the sight of several Avosets hovering over the margins and islets of the pond, and although it was late, and I was both fatigued and hungry, I could not resist the temptation of endeavouring to find the cause of their being so far from the sea. Leaving my horse at liberty, I walked toward the pond, when, on being at once assailed by four of the birds, I felt confident that they had nests, and that their mates were either sitting or tending their young. The pond, which was about two hundred yards in length, and half as wide, was surrounded by tall bulrushes extending to some distance from the margin. Near its centre were several islets, eight or ten yards in length, and disposed in a line. Having made my way through the rushes, I found the water only a few inches deep; but the mud reached above my knees, as I carefully advanced towards the nearest island. The four birds kept up a constant noise, remained on wing, and at times dived through the air until close to me, evincing their displeasure at my intrusion. My desire to shoot them, however, was restrained by my anxiety to study their habits as closely as possible; and as soon as I had searched the different inlets, and found three nests with eggs, and a female with her brood, I returned to my horse, and proceeded to Vincennes, about two miles distant. Next morning at sunrise I was snugly concealed amongst the rushes, with a fair view of the whole pond. In about an hour the male ceased to fly over

American Avocet

Young in First Winter Plumage Adult in the Distance

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith^d Printed & Col^d by J. T. Bowen Philad^a

me, and betook themselves to their ordinary occupations, when I noted the following particulars.

On alighting, whether on the water or on the ground, the American Avoset keeps its wings raised until it has fairly settled. If in the water, it stands a few minutes balancing its head and neck, somewhat in the manner of the Tell-tale Godwit. After this it stalks about searching for food, or runs after it, sometimes swimming for a yard or so while passing from one shallow to another, or wading up to its body, with the wings partially raised. Sometimes they would enter among the rushes and disappear for several minutes. They kept apart, but crossed each other's path in hundreds of ways, all perfectly silent, and without shewing the least symptom of enmity towards each other, although whenever a Sandpiper came near, they would instantly give chase to it. On several occasions, when I purposely sent forth a loud shrill whistle without stirring, they would suddenly cease from their rambling, raise up their body and neck, emit each two or three notes, and remain several minutes on the alert, after which they would fly to their nests, and then return. They search for food precisely in the manner of the Roseate Spoonbill, moving their heads to and fro sideways, while their bill is passing through the soft mud; and in many instances, when the water was deeper, they would immerse their whole head and a portion of the neck, as the Spoonbill and Red-breasted Snipe are wont to do. When, on the contrary, they pursued aquatic insects, such as swim on the surface, they ran after them, and on getting up to them, suddenly seized them by thrusting the lower mandible beneath them, while the other was raised a good way above the surface, much in the manner of the Black Shear-water, which, however, performs this act on wing. They were also expert at catching flying insects, after which they ran with partially expanded wings.

I watched them as they were thus engaged about an hour, when they all flew to the islets where the females were, emitting louder notes than usual. The different pairs seemed to congratulate each other, using various curious gestures; and presently those which had been sitting left the task to their mates, and betook themselves to the water, when they washed, shook their wings and tail, as if either heated, or tormented by insects, and then proceeded to search for food in the manner above described. Now, reader, wait a few moments until I eat my humble breakfast.

About eleven o'clock the heat had become intense, and the Avosets gave up their search, each retiring to a different part of the pond, where, after pluming themselves, they drew their heads close to their shoulders, and remained perfectly still, as if asleep, for about an hour, when they shook themselves simultaneously, took to wing, and rising to the height of thirty or forty yards, flew off towards the waters of the Wabash river.

I was now desirous of seeing one of the sitting birds on its nest, and leaving my hiding-place, slowly, and as silently as possible, proceeded toward the nearest islet on which I knew a nest to be, having the evening before, to mark the precise spot, broken some of the weeds, which were now withered by the heat of the sun. You, good reader, will not, I am sure, think me prolix; but as some less considerate persons may allege that I am tediously so, I must tell them here that no student of Nature ever was, or ever can be, too particular while thus marking the precise situation of a bird's nest. Indeed, I myself have lost many nests by being less attentive. After this short but valuable lecture, you and I will do our best to approach the sitting bird unseen by it. Although a person can advance but slowly when wading through mud and water knee-deep, it does not take much time to get over forty or fifty yards, and thus I was soon on the small island where the Avoset was comfortably seated on her nest. Softly, and on all four, I crawled toward the spot, panting with heat and anxiety. Now, reader, I am actually within three feet of the unheeding creature, peeping at her through the tall grasses. Lovely bird! how innocent, how unsuspecting, and yet how near to thine enemy, albeit he be an admirer of thy race! There she sits on her eggs, her head almost mournfully sunk among the plumage, and her eyes, unanimated by the sight of her mate, half closed, as if she dreamed of future scenes. Her legs are bent beneath her in the usual manner. I have seen this, and I am content. Now she observes me, poor thing, and off she scrambles,—running, tumbling, and at last rising on wing, emitting her clicking notes of grief and anxiety, which none but an inconsiderate or callous-hearted person could hear without sympathising with her.

The alarm is sounded, the disturbed bird is floundering hither and thither over the pool, now lying on the surface as if ready to die, now limping to induce me to pursue her and abandon her eggs. Alas, poor bird! Until that day I was not aware that gregarious birds, on emitting cries of alarm, after having been scared from their nest, could induce other incubating individuals to leave their eggs also, and join in attempting to save the colony. But so it was with the Avosets, and the other two sitters immediately rose on wing and flew directly at me, while the one with the four younglings betook herself to the water, and waded quickly off, followed by her brood, which paddled along swimming, to my astonishment, as well as ducklings of the same size.

How far such cries as those of the Avoset may be heard by birds of the same species I cannot tell; but this I know, that the individuals which had gone toward the Wabash, reappeared in a few minutes after I had disturbed the first bird, and hovered over me. But now, having, as I thought, obtain-

ed all desirable knowledge of these birds, I shot down five of them, among which I unfortunately found three females.

The nests were placed among the tallest grasses, and were entirely composed of the same materials, but dried, and apparently of a former year's growth. There was not a twig of any kind about them. The inner nest was about five inches in diameter, and lined with fine prairie grass, different from that found on the islets of the pond, and about two inches in depth, over a bed having a thickness of an inch and a half. The islets did not seem to be liable to inundation, and none of the nests exhibited any appearance of having been increased in elevation since the commencement of incubation, as was the case with those described by WILSON. Like those of most waders, the eggs were four in number, and placed with the small ends together. They measured two inches in length, one inch and three-eighths in their greatest breadth, and were, exactly as WILSON tells us, "of a dull olive-colour, marked with large irregular blotches of black, and with others of a fainter tint." To this I have to add, that they are pear-shaped and smooth. As to the time of hatching, I know nothing.

Having made my notes, and picked up the dead birds, I carefully waded through the rushes three times around the whole pond, but, being without my dog, failed in discovering the young brood or their mother. I visited the place twice the following day, again waded round the pond, and searched all the islets, but without success: not a single Avoset was to be seen; and I am persuaded that the mother of the four younglings had removed them elsewhere.

Since that time my opportunities of meeting with the American Avoset have been few. On the 7th of November, 1819, while searching for rare birds a few miles from New Orleans, I shot one which I found by itself on the margin of Bayou St. John. It was a young male, of which I merely took the measurements and description. It was very thin, and had probably been unable to proceed farther south. Its stomach contained only two small fresh-water snails and a bit of stone. In May, 1829, I saw three of these birds at Great Egg Harbour, but found no nests, although those of the Long-legged Avoset of WILSON were not uncommon. My friend JOHN BACHMAN considers them as rare in South Carolina, where, however, he has occasionally seen some on the gravelly shores of the sea islands.

On the 16th of April, 1837, my good friend Captain NAPOLEON COSTE, of the United States Revenue Cutter the Campbell, on board of which I then was, shot three individuals of this species on an immense sand-bar, intersected by pools, about twelve miles from Derniere Island on the Gulf of Mexico, and brought them to me in perfect order. They were larger, and perhaps handsomer, than any that I have seen; and had been killed out of a

flock of five while feeding. He saw several large flocks on the same grounds, and assured me that the only note they emitted was a single whistle. He also observed their manner of feeding, which he represented as similar to that described above.

My friend THOMAS NUTTALL says in a note, that he "found this species breeding on the islands of shallow ponds throughout the Rocky Mountains about midsummer. They exhibited great fear and clamour at the approach of the party, but no nests were found, they being then under march." Dr. RICHARDSON states, that it is abundant on the Saskatchewan Plains, where it frequents shallow lakes, and feeds on insects and small fresh-water crustacea.

The flight of the American Avoset resembles that of the *Himantopus nigricollis*. Both these birds pass through the air as if bent on removing to a great distance, much in the manner of the Tell-tale Godwit, or with an easy, rather swift and continued flight, the legs and neck fully extended. When plunging towards an intruder, it at times comes downwards, and passes by you, with the speed of an arrow from a bow, but usually in moving off again, it suffers its legs to hang considerably. I have never seen one of them exhibit the bending and tremulous motions of the legs spoken of by writers, even when raised suddenly from the nest; and I think that I am equally safe in saying, that the bill has never been drawn from a fresh specimen, or before it has undergone a curvature, which it does not shew when the bird is alive. The notes of this bird resemble the syllable *click*, sometimes repeated in a very hurried manner, especially under alarm.

AMERICAN AVOCET, *Recurvirostra Americana*, Wils. Amer. Orn., vol. vii. p. 126.
RECURVIROSTRA AMERICANA, Bonap. Syn., p. 394.
RECURVIROSTRA AMERICANA, *American Avocet*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 375.
AMERICAN AVOCET, Nutt. Man., vol. ii. p. 74.
AMERICAN AVOCET, *Recurvirostra Americana*, Aud. Orn. Biog., vol. iv. p. 168.

Male, 18, 30⅝.

Passes along the coast from Texas northward, in small numbers, a few breeding in New Jersey. Indiana, Illinois, and Missouri. Abundant in the Rocky Mountains and the Fur Countries. Migratory.

Adult Male.

Bill more than twice the length of the head, very slender, much depressed, tapering to a point, and *slightly* recurved. Upper mandible with the dorsal line straight for half its length, then a little curved upwards, and at the tip slightly decurved, the ridge broad and flattened, the edges rather thick, the nasal groove rather long and very narrow. Nostrils linear, basal, pervious. Lower mandible with the angle long and very narrow, the dorsal line

slightly curved upwards, the point very slender, extremely thin and a little curved upwards.

Head small, rounded above, rather compressed. Neck long. Body compact, ovate. Legs very long, slender; tibia elongated, bare for half its length, and reticulated; tarsus very long, compressed, reticulated with hexagonal scales; toes rather short, the first extremely small; outer toe a little longer than inner; the anterior toes connected by webs of which the anterior margin is deeply concave, the lateral toes thickly margined. Claws very small, compressed, rather blunt.

Plumage soft and blended. Wings long, of moderate breadth, pointed; primaries straightish, tapering, the first longest, the rest rapidly graduated; secondaries broad, incurved, the outer rounded, the rest becoming pointed, the inner elongated and tapering. Tail short, even, of twelve rather narrow, rounded feathers.

Bill black. Iris bright carmine. Feet light blue, webs flesh-coloured towards their edges, claws black. Head, neck, and fore part of breast, reddish-buff, the parts around the base of the bill and the eye nearly white, The back is white; but on its fore part is a longitudinal band of brownish-black elongated feathers on each side, and the inner scapulars are of the same colour, the outer and the anterior edge of the wing being white. The wing brownish-black, with a broad band of white formed by the tips of the secondary coverts, four of the inner secondaries, and the basal part, with the inner webs and outer edges of the rest. The under parts white, excepting some of the primary quills and some of their coverts, which are greyish-brown.

Length to end of tail 18 inches, to end of wings 18½, to end of claws 23½; extent of wings 30⅝; wing from flexure 9½; tail 3½; bill along the ridge 3¾; bare part of the tibia 2 1/32; tarsus 3⅝; hind toe and claw 1/2; middle toe and claw 1 1/2; breadth of foot extended 2⅝. Weight 16¾ oz.

The Female is similar to the male, but somewhat smaller.

Young in winter.

The young in winter is similar to the adult, but with the head and neck white, the dark colours of a browner tint.

Length to end of tail 18 inches, to end of wings 18½; extent of wings 30½. Weight 13 oz.

In structure the Avosets are similar to the Numenii and Totani. In an adult female the tongue is very short in proportion to the length of the bill, being only 1¾ inches long, slightly emarginate at the base with a few conical papillæ, slender, tapering to a point, horny on the back, and flattened above. On the palate are two longitudinal series of blunt papillæ. The posterior aperture of the nares is linear, 10 twelfths long, papillate on the edges. The œsophagus is 7 inches and 9 twelfths long, inclines to the right side, and

when the neck is bent becomes posterior at the middle, as in the Herons and other long-necked birds; its diameter 5 twelfths at the upper part, dilated to 8 twelfths previous to its entrance into the thorax. The proventriculus is 1 inch long and 7 twelfths in diameter; its glandules cylindrical, 1 twelfth long. The stomach is a gizzard of moderate strength, oblong, 1½ inches in length, 10 twelfths in breadth, its right lateral muscle 4 twelfths thick. Its contents were remains of small shells. Its inner membrane of moderate thickness, hard, longitudinally rugous, and deeply tinged with red. The intestine is 3 feet long, and 4 twelfths in diameter; the rectum 2 inches long; of the cœca one is 2¾ inches long, the other 2½, their diameter 2 twelfths.

In another individual the intestine is 3 feet 9 inches long; one of the cœca 2¾ inches, the other 3; the stomach 1½ by 1 1/12. Its contents small shell-fish and fragments of quartz.

The trachea is 6½ inches long; its rings extremely thin and unossified, 140 in number, its diameter 3¼ twelfths, nearly uniform throughout, but rather narrower in the middle. The lateral muscles are very thin. The bronchi are short, of about 10 rings.

Genus IX.—HIMANTOPUS, *Briss.* STILT.

Bill about twice as long as the head, very slender, roundish, tapering, slightly recurved; upper mandible with its outline slightly curved upwards, the ridge rather flattened, the sides convex, the edges inflected, the tip narrow and rather acute; nasal groove nearly half the length of the bill; lower mandible with the angle very long and narrow, the sides grooved as far as the angle. Nostrils linear, direct, sub-basal. Head small, ovate, rounded above; neck very long and slender; body rather compact. Legs extremely elongated, slender; tibia bare for more than half its length, covered anteriorly with large curved scutella; tarsus very long, moderately compressed, scutellate before, reticulate on the sides; toes of moderate length, slender; first toe wanting; outer a little longer than inner, anterior toes webbed at the base. Claws small, nearly straight, moderately compressed. Plumage ordinary. Wings very long, of moderate breadth, acute, the first quill longest. Tail short, even, of twelve feathers.

Black Necked Stilt

Male.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen. Philad.a

BLACK-NECKED STILT.

HIMANTOPUS NIGRICOLLIS, *Vieill.*

PLATE CCCLIV.—ADULT MALE.

A few individuals of this singular species occasionally pass the winter in the lower parts of Louisiana, especially in the section called Oppellousas. I have also found it at the same period in the Floridas, but the greater number follow the shores of the Gulf of Mexico, and proceed beyond our southern limits. In April, 1837, I observed their first appearance at Galveston Bay in Texas, where many remained until our departure. They were in small flocks, seldom composed of more than seven or eight individuals, which almost immediately separated into parties of two or three, and commenced their search for food. They kept about the small shallow brackish ponds on the islands of the bay, and now and then were observed following the sinuosities of bayous in company with other birds. They were much more shy than they are while breeding, and it was with some difficulty that we procured specimens. When one was killed, the rest would fly to a considerable distance, sometimes from one island to another, in a rapid manner, with regular beats of the wings, their necks and legs extended. On such occasions they uttered a whistling cry, different from the *cleek, cleek, cleek*, which they emit when they have nests or young.

All the writers who have described the habits of this bird, allege that it walks with a "staggering gait;" but this is by no means the case, for they appeared to us to walk as firmly as other long-legged birds, such as Herons, Curlews, and the American Avoset; and I had many opportunities of observing them, as had my friend EDWARD HARRIS, my son, and all the members of our party.

Toward the end of April, flocks of this bird reach the Middle Districts, by following the coast, for they are very rarely met with at any great distance from the sea-shore. They generally betake themselves to extensive marshes abounding in muddy inlets and small ponds, in the vicinity of which they usually place their nests. About the middle of May, parties of from ten to twenty collect, and are seen wading sometimes up to their breast, in search of food, which is extremely abundant in such places. They are now paired, and select suitable spots for their nests, which are generally not far distant from each other, and near the margins of the ponds, or on small

islets. The nest is very similar to that of the Willet, or Semi-palmated Snipe, *Totanus semipalmatus*, being rather large, and formed of dry weeds and the twigs of small shrubs. I have never observed the singular manner of augmenting and raising their tenements, described by ALEXANDER WILSON, although, like him, I have found and examined several in the very same districts. The eggs are always four, placed with the smaller ends together, pyriform, almost two inches long, with the smaller end rounded, 1⅛ in their greatest breadth, of a pale yellowish-clay colour, and plentifully marked with large irregular blotches and lines of brownish-black.

While the females are sitting, the males pay them much attention, acting in this respect like those of the American Avoset, watching the approach of intruders, giving chase to the Red-winged Starlings, as well as to the Fishing and American Crows, and assailing the truant young gunner or egger. When there is no appearance of annoyance, they sometimes roam as far as the sea-beach. When the young are hatched, they leave the nest, and follow their parents through the grass, but on the appearance of danger squat and remain motionless. About the beginning of September, young and old commence their journey southward.

This species is rather scarce along the shores of the Carolinas; nor is it abundant in any part of the United States, and is seldom seen to the eastward beyond Long Island. Its food consists of insects, small crustacea, worms, and young fry of fishes. I have frequently observed them running after flies, and attempting to seize the smaller Libellulæ. When wounded so as to fall on the water, they are unable to dive, but on reaching the shore they run nimbly off and hide themselves.

I feel confident that in spring the males migrate apart from the females, but in autumn in company with them. The flesh of this species is not decidedly good or bad, being of ordinary quality. The males are larger than the females, and individuals of both sexes vary considerably in size.

LONG-LEGGED AVOCET, *Recurvirostra Himantopus*, Wils. Amer. Orn., vol. vii. p. 48.
HIMANTOPUS NIGRICOLLIS, Bonap. Syn., p. 322.
BLACK-NECKED STILT, Nutt. Man., vol. ii. p. 8.
BLACK-NECKED STILT, *Himantopus nigricollis*, Aud. Orn. Biog., vol. iv. p. 247.

Male, 14½, 27. Female, 14, 25¾.

Rather common in Texas during spring. Breeds on different parts of the Atlantic coast, as far as Long Island. A few spend the winter about the mouths of the Mississippi. Migratory.

Adult Male.

Bill about twice as long as the head, very slender, roundish, tapering, slightly recurved. Upper mandible with its outline very slightly curved

upwards, at the tip declinate; the ridge convex, the sides convex, the edges sharp and inflected, the tip narrow and rather acute. Nasal groove nearly half the length of the bill; nostrils linear, direct, sub-basal, pervious. Lower mandible with the angle very long and narrow, the sides grooved as far as the angle, the edges sharp and inflected, the tip narrow.

Head small, ovate, rounded above; neck very long and slender; body rather compact. Legs extremely elongated and slender; tibia bare for more than half its length, covered anteriorly with large curved scutella; tarsus very long, moderately compressed, scutellate before, reticulate on the sides; toes of moderate length, slender; hind toe wanting, outer a little longer than inner, and connected with the middle toe by a web extending nearly to the second joint; the inner toe also connected with the middle by a very short web. Claws small, nearly straight, moderately compressed.

Plumage ordinary, the feathers ovate and rounded. Wings very long, of moderate breadth, acute, the first quill longest, the other primaries rapidly graduated. Tail short, even, of twelve feathers.

Bill black, iris bright carmine; feet lake-coloured, claws dusky. Forehead, a spot above the eye, another below it, fore part and sides of the neck, and all the other lower parts, pure white. Upper part of head, hind neck, and upper parts, bluish-black, glossed with green; tail white.

Length to end of tail 14½ inches, to end of wings 16½, to end of claws 21¾; extent of wings 27; wing from flexure 9; tail 2$\frac{11}{12}$; bill along the ridge 2$\frac{8}{12}$, along the edge of lower mandible 2$\frac{11}{12}$; bare part of tibia 3¼; tarsus 4$\frac{9}{12}$; middle toe 1½, its claw $\frac{7}{12}$. Weight 6¼ oz.

The Female is smaller than the male, but otherwise similar.

Length to end of tail 14 inches, to end of wings 15¼, to end of claws 20; extent of wings 25¾. Weight 5 oz.

The median ridge of the anterior part of the roof of the mouth is furnished with a few short papillæ. The tongue is 1 inch 2 twelfths long, slender, tapering, emarginate and papillate at the base. The œsophagus is 7 inches long, with an average diameter of 4 twelfths; the proventriculus 9 twelfths long, and 6 twelfths in diameter. The stomach is elliptical, 1 inch in length, 8½ twelfths in breadth; its lateral muscles of moderate strength, the right being 4 twelfths thick; the inner coat or epithelium dense, longitudinally rugous, and of a brownish-red colour. The intestine is 20 inches long, its diameter varying from 3 to 1½ twelfths. The cœca are 1½ inches long, $\frac{1}{12}$ in diameter at the base, 2 twelfths towards the end, which is blunt.

The trachea is 5¼ inches long, rather wide, its diameter at the upper part 3 twelfths, gradually diminishing to 1½ twelfths; the rings 120, unossified, excepting a few at the lower part. The contractor muscles are feeble; the

sterno-tracheal slender. The bronchi are very short, with about 10 half rings.

The Prince of MUSIGNANO has introduced into his lately published list a species of this genus, under the name of *Himantopus Mexicanus*. I have received from Florida two skins, which from their large size might at first sight be thought to differ from the common kind; but after closely comparing them with my other specimens, I can find no difference indicative of a distinction of species. Nor have I ever met with individuals in North America of any other species than that above described.

GENUS X.—NUMENIUS, *Briss.* CURLEW

Bill very long, slender, sub-cylindrical, slightly compressed, more or less arcuate or decurved; upper mandible with the ridge broad and flattened at the base, broad and rounded in the rest of its extent, a deep groove running from the nostrils to near the tip, which is decurved, enlarged so as to form an oblong obtuse knob, projecting beyond the point of the lower mandible, the edges rounded; lower mandible similar in its curvature to the upper, its angle extremely narrow, and extending to near the middle, the ridge rounded, the sides with a shallow groove to near the end, the edges directly meeting those of the upper, the tip obtuse. Head rather small, oblong, compressed; neck long; body compact. Feet long; tibia bare below; tarsus scaly above, scutellate for two-thirds; toes rather small, scutellate, first very small, lateral nearly equal. Claws small, compressed, blunted. Wings long, very acute, the first quill longest, some of the inner secondaries greatly elongated. Tail short, much rounded, of twelve rounded feathers.

Long-billed Curlew.

♂ Male ♀ Female

THE LONG-BILLED CURLEW.

NUMENIUS LONGIROSTRIS, *Wils.*

PLATE CCCLV.—MALE AND FEMALE.

The Long-billed Curlew is a constant resident in the southern districts of the United States, whereas the other species are only autumnal and winter visiters. It is well known by the inhabitants of Charleston that it breeds on the islands on the coast of South Carolina; and my friend the Reverend JOHN BACHMAN has been at their breeding grounds. That some individuals go far north to breed, is possible enough, but we have no authentic account of such an occurrence, although many *suppositions* have been recorded. All that I have to say on this subject is, that the bird in question is quite unknown in the Magdeleine Islands, where, notwithstanding the assertions of the fishermen, they acknowledged that they had mistaken Godwits for Curlews. In Newfoundland, I met with a well-informed English gentleman, who had resided in that island upwards of twenty years, and described the Common Curlew of Europe with accuracy, but who assured me that he had observed only two species of Curlew there, one about the size of the Whimbrel—the *Numenius hudsonicus*, the other smaller—the *N. borealis*, and that only in August and the beginning of September, when they spend a few days in that country, feed on berries, and then retire southward. Mr. JONES of Labrador, and his brother-in-law, who is a Scotch gentleman, a scholar, and a sportsman, gave me the same account. None of my party observed an individual of the species in the course of our three months' stay in the country, although we saw great numbers of the true Esquimaux Curlew, *N. Borealis*. Yet I would not have you to suppose that I do not give credit to the reports of some travellers, who had said that the Long-billed Curlew is found in the fur countries during summer. This may be true enough; but none of the great northern travellers, such as RICHARDSON, ROSS, PARRY, or FRANKLIN, have asserted this as a fact. Therefore if the bird of which I speak has been seen far north, it was in all probability a few stragglers that had perhaps been enticed to follow some other species. I am well aware of the propensity it has to ramble, as I have shot some in Missouri, Indiana, Kentucky, Arkansas, and Mississippi; but the birds thus obtained were rare in those districts, where the species only appears at remote periods; and in

every instance of the kind I have found the individuals much less shy than usual, and apparently more perplexed than frightened by the sight of man.

Until my learned friend, Prince CHARLES BONAPARTE, corrected the errors which had been made respecting the Curlews of North America, hardly one of these birds was known from another by any naturalist, American or European. To WILSON, however, is due the merit of having first published an account of the Long-billed Curlew as a species distinct from the Common Curlew of Europe.

This bird is the largest of the genus found in North America. The great length of its bill is of itself sufficient to distinguish it from every other. The bill, however, in all the species, differs greatly, according to the age of the individual, and in the present Curlew I have seen it in some birds nearly three inches shorter than in others, although all were full grown. In many of its habits, the Long-billed Curlew is closely allied to the smaller species of Ibis; its flight and manner of feeding are similar, and it has the same number of eggs. Unlike the Ibis, however, which always breeds on trees, and forms a large nest, the Curlew breeds on the ground, forming a scanty receptacle for its eggs; yet, according to my friend BACHMAN, the latter, like the former, places its nests "so close together, that it is almost impossible for a man to walk between them, without injuring the eggs."

The Long-billed Curlew spends the day in the sea-marshes, from which it returns at the approach of night, to the sandy beaches of the sea-shores, where it rests until dawn. As the sun sinks beneath the horizon, the Curlews rise from their feeding-grounds in small parties, seldom exceeding fifteen or twenty, and more usually, composed of only five or six individuals. The flocks enlarge, however, as they proceed, and in the course of an hour or so the number of birds that collect in the place selected for their nightly retreat sometimes amounts to several thousands. As it was my good fortune to witness their departures and arrivals, in the company of my friend BACHMAN, I will here describe them.

Accompanied by several friends, I left Charleston one beautiful morning, the 10th of November, 1831, with a view to visit Cole's Island, about twenty miles distant. Our crew was good, and although our pilot knew but little of the cuttings in and out of the numerous inlets and channels in our way, we reached the island about noon. After shooting various birds, examining the island, and depositing our provisions in a small summer habitation then untenanted, we separated; some of the servants went off to fish, others to gather oysters, and the gunners placed themselves in readiness for the arrival of the Curlews. The sun at length sunk beneath the water-line that here formed the horizon; and we saw the birds making their first appearance. They were in small parties of two, three, or five, and by no means shy. These

seemed to be the birds which we had observed near the salt-marshes, as we were on our way. As the twilight became darker the number of Curlews increased, and the flocks approached in quicker succession, until they appeared to form a continuous procession, moving not in lines, one after another, but in an extended mass, and with considerable regularity, at a height of not more than thirty yards, the individuals being a few feet apart. Not a single note or cry was heard as they advanced. They moved for ten or more yards with regular flappings, and then sailed for a few seconds, as is invariably the mode of flight of this species, their long bills and legs stretched out to their full extent. They flew directly towards their place of rest, called the "Bird Banks," and were seen to alight without performing any of the evolutions which they exhibit when at their feeding-places, for they had not been disturbed that season. But when we followed them to the Bird Banks, which are sandy islands of small extent, the moment they saw us land, the congregated flocks, probably amounting to several thousand individuals all standing close together, rose at once, performed a few evolutions in perfect silence, and re-alighted as if with one accord on the extreme margins of the sandbank close to tremendous breakers. It was now dark, and we left the place, although some flocks were still arriving. The next morning we returned a little before day; but again as we landed, they all rose a few yards in the air, separated into numerous parties, and dispersing in various directions, flew off towards their feeding-grounds, keeping low over the waters, until they reached the shores, when they ascended to the height of about a hundred yards, and soon disappeared.

Now, reader, allow me to say a few words respecting our lodgings. Fish, fowl, and oysters, had been procured in abundance; and besides these delicacies, we had taken with us from Charleston some steaks of beef, and a sufficiency of good beverage. But we had no cook, save your humble servant. A blazing fire warmed and lighted our only apartment. The oysters and fish were thrown on the hot embers; the steaks we stuck on sticks in front of them; and ere long every one felt perfectly contented. It is true we had forgotten to bring salt with us; but I soon proved to my merry companions that hunters can find a good substitute in their powder-flasks. Our salt on this occasion was gunpowder, as it has been with me many a time; and to our keen appetites, the steaks thus salted were quite as savoury as any of us ever found the best cooked at home. Our fingers and mouths, no doubt, bore marks of the "villainous saltpetre," or rather of the charcoal with which it was mixed, for plates or forks we had none; but this only increased our mirth. Supper over, we spread out our blankets on the log floor, extended ourselves on them with our feet towards the fire, and our arms under our heads for pillows. I need not tell you how soundly we slept.

The Long-billed Curlews are in general easily shot, but take a good charge. So long as life remains in them, they skulk off among the thickest plants, remaining perfectly silent. Should they fall on the water they swim towards the shore. The birds that may have been in company with a wounded one fly off uttering a few loud whistling notes. In this respect, the species differs from all the others, which commonly remain and fly about you. When on land, they are extremely wary; and unless the plants are high, and you can conceal yourself from them, it is very difficult to get near enough. Some one of the flock, acting as sentinel, raises his wings, as if about to fly, and sounds a note of alarm, on which they all raise their wings, close them again, give over feeding, and watch all your motions. At times a single step made by you beyond a certain distance is quite enough to raise them, and the moment it takes place, they all scream and fly off. You need not follow the flock. The best mode of shooting them is to watch their course for several evenings in succession; for after having chosen a resting-place, they are sure to return to it by the same route, until greatly annoyed.

The food of the Long-billed Curlews consists principally of the small crabs called fiddlers, which they seize by running after them, or by pulling them out of their burrows. They probe the wet sand to the full length of their bill, in quest of sea-worms and other animals. They are also fond of small salt-water shell-fish, insects, and worms of any kind; but I have never seen them searching for berries on elevated lands, as the Esquimaux Curlews are wont to do. Their flesh is by no means so delicate as that of the species just mentioned, for it has usually a fishy taste, and is rarely tender, although many persons consider it good. They are sold at all seasons in the markets of Charleston, at about twenty-five cents the pair.

Rambling birds of this species are sometimes seen as far as the neighbourhood of Boston; for my learned friend THOMAS NUTTALL says in his Manual, that "they get so remarkably fat, at times, as to burst the skin in falling to the ground, and are then superior in flavour to almost any other game bird of the season. In the market of Boston, they are seen as early as the 8th of August." I found them rare in East Florida in winter and spring. They were there seen either on large savannahs, or along the sea-shore, mixed with marbled Godwits, Tell-tales, and other species.

LONG-BILLED CURLEW, *Numenius longirostris*, Wils. Amer. Orn., vol. viii. p. 23.

NUMENIUS LONGIROSTRIS, Bonap. Syn., p. 314.

NUMENIUS LONGIROSTRIS, *Long-billed Curlew*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 376.

LONG-BILLED CURLEW, Nutt. Man., vol. ii. p. 94.

LONG-BILLED CURLEW, *Numenius longirostris*, Aud. Orn. Biog., vol. iii. p. 240; vol. v. p. 587.

Male, 26, 40.

Resident, and breeds in Texas and on the islands off South Carolina. Stragglers go far north. Columbia river. Occasionally seen in the interior.

Adult male.

Bill excessively elongated, being more than four times the length of head, very slender, sub-cylindrical, slightly compressed, nearly straight to the middle, beyond which it is slightly curved. Upper mandible with the ridge broad and flat at the base, broad and rounded in the rest of its extent, a deep groove running from the nostrils to near the tip, which is decurved, enlarged so as to form an oblong obtuse knob, projecting beyond the point of the lower mandible, the edges rounded, the inner surface with a deep narrow groove. Nostrils basal, lateral, longitudinal, linear, pervious. Lower mandible similar in its curvature to the upper, its angle extremely narrow, and extending to near the middle, the ridge rounded, the sides with a shallow groove to near the end, the edges directly meeting those of the upper mandible, the tip obtuse.

Head rather small, oblong, compressed. Neck long and slender. Body rather slender. Feet long and rather stout. Toes rather small, scutellate above; first very small, second and fourth about equal, third considerably longer, flat beneath and broadly marginate, the three anterior connected by short webs, of which the outer is much larger. Bare part of tibia covered with transverse series of angular scales, as is the upper part of the tarsus, its lower two-thirds with scutella in front. Claws small, compressed, blunt, that of middle toe largest, curved outwards, with a sharp dilated inner edge.

Plumage soft and blended, on the fore part of the head very short. Wings long, very acute, narrow, the first quill longest, the second a little shorter, the rest rapidly graduated; secondaries of moderate length, slightly incurved, narrowly rounded, some of the inner greatly elongated and tapering. Tail short, much rounded, of twelve rounded feathers.

Upper mandible of a rich deep brown in its whole extent, as is the lower in its terminal half, its basal portion being flesh-colour, tinged with brown. Iris hazel. Feet light greyish-blue; claws dusky. The ground colour of the plumage is light yellowish-red; the head marked with oblong spots, the back with spots and bars of brownish-black. Alula and outer webs of first four quills deep brown, the rest of the quills of the general colour, barred on both webs with dark brown, as are the tail feathers. Chin or upper part of throat white, as is the lower eyelid; neck marked with longitudinal lines of brownish black; sides barred with the same, as are the lower larger wing-coverts; the rest of the lower parts unspotted, the sides and under wing-coverts of a richer yellowish-red than the rest.

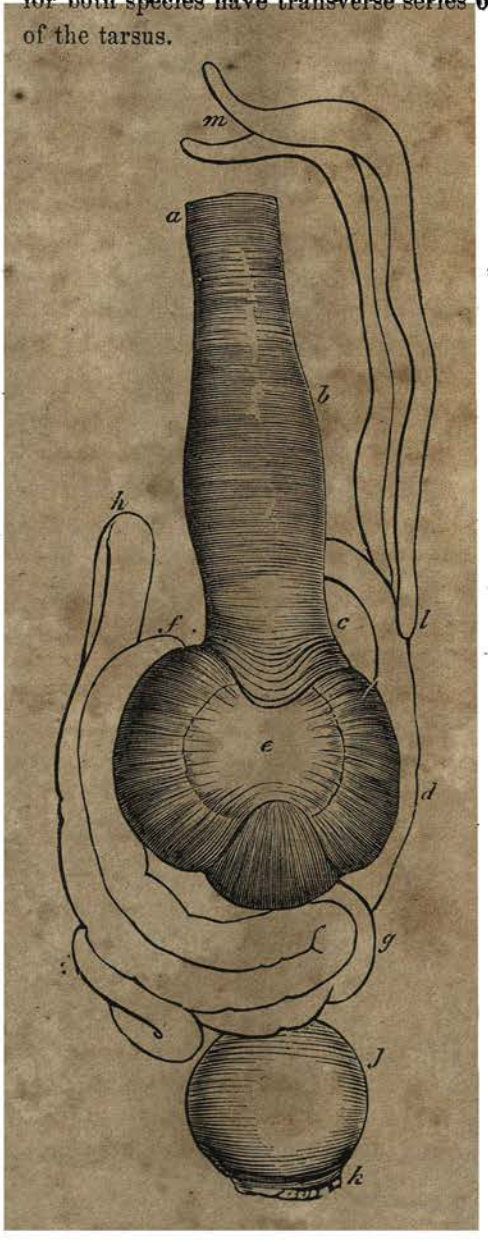
Length to end of tail 26 inches, to end of wings 25, to end of claws 29;

extent of wings 40 ; wing from flexure 11½ ; tail 4¼ ; bill along the back 8½ ; along the edge of lower mandible 8 ; bare part of tibia 2 ; tarsus 3 7/12 ; middle toe 1 10/12, its claw 5/12. Weight 1¾ lbs.

Adult Female.

The female cannot be distinguished from the male by external appearance.

The bill varies in length from 7 to 9 inches. It has been remarked that the tarsus of this species is scutellate anteriorly in its whole length, whereas that of *N. arquata* is scutellate on its lower half only ; but this is incorrect ; for both species have transverse series of small scales on the upper third of the tarsus.



The two palatal ridges meeting anteriorly to the aperture of the nares form an elevated line in the middle, running all the way to the tip of the upper mandible, and the lower mandible has a median groove ; both are internally formed by two inclined planes, which leave a vacant space when the bill is closed. The tongue is very small, triangular, narrow, flat above, pointed, horny beneath; its base sagittate and papillate; its length only 1 inch 2 twelfths, whereas that of the bill, from the opening to the tip, is 8 inches. The width of the mouth is 10 twelfths. The œsophagus, *a b c*, is 8¾ inches long, of the nearly uniform width of 7 twelfths, contracting to ½ inch within the thorax; but the proventriculus, *b c*, expanded to 9 twelfths; at the top, however, it is funnel-shaped, where its greatest width at the hyoid bone is 1 inch. The stomach, *c d e f*, is a large and very strong gizzard, of a roundish or transversely elliptical form, 1½ inches long, 1¾ inches in breadth; its

lateral muscles very strong, the left 9 twelfths thick, the right 1 inch; the lower muscle very prominent; the tendons large and strong; the epithelium very thick, with broad longitudinal rugæ. The proventricular glands are oblong, forming a belt 9 twelfths in breadth. The contents of the stomach are remains of crustacea. The intestine, *f g h i j k*, which is 39½ inches long, 5 twelfths in width in the duodenal portion, *f g h*, 3 twelfths toward the middle, curves in the usual manner at the distance of 3½ inches, passes forward as far as the proventriculus, then turns backward to near the cloaca along the right side, again forward, backward, forward, backward, and lastly forward to above the tip of the heart, where it ends in the rectum, and sends off the cœca; the rectum is 5 twelfths long, opening by a very small aperture into a globular cloaca, *j k*, 1 inch in diameter. The cœca, *l m*, which come off at the distance of 3 inches from the extremity, are 4 inches long, 1½ twelfths in width for 1½ inches, then from 1 twelfth to 3 twelfths, being enlarged and contracted at intervals, the tip for ½ inch only ¾ twelfth in width. The lobes of the liver are very unequal; the left lies beneath the proventriculus and the anterior part of the gizzard, under the lower edge of which it sends a long thin process; the right lobe is very much larger, narrow, and passes under the whole length of the stomach.

Trachea 6 inches 2 twelfths long, a little flattened, from 3½ twelfths to 2¼ twelfths in breadth; its rings firm, 120 in number, with 2 dimidiate rings. Bronchi rather wide, of 18 half rings. Lateral muscles strong; a single pair of inferior laryngeal muscles going to the last half ring.

Dimensions of two male individuals killed on the 26th of April, 1837, at Galveston.

Length to end of tail 20¼, 20¾ inches, to end of wings the same; to end of claws 24, 29½; extent of wings 36¾, 38½; weight 1 lb. 1 oz., 1 lb. 9 oz.

THE HUDSONIAN CURLEW.

NUMENIUS HUDSONICUS, *Lath.*

PLATE CCCLVI.—MALE.

The habits of this species, which, until a few years ago, was always confounded with the Esquimaux Curlew, *Numenius borealis*, are yet in a great measure unknown. Every person who writes on American birds repeats, that it arrives at Hudson's Bay, breeds farther north, &c.; but none has yet given any of those details so necessary to enable the student of nature to judge in what respects this species resembles, or differs from others, at the season of reproduction. During my visit to Labrador, I made diligent inquiry respecting it and the Esquimaux Curlew, but I obtained no information farther than that the latter is extremely abundant for a few weeks in early autumn, and that the present species was entirely unknown. Even Mr. JONES and his sons, who had probably killed thousands of the species just mentioned, had never seen it in the course of their long residence at Bras d'Or. Nor is our information respecting their winter retreats much better, for scarcely any of them are ever seen in the colder months within the limits of the United States, and their movements during their migrations are more rapid than those of most water birds. In short, I am unable to present you with such an account of them as I could have wished.

I have found this species abundant on the shores of New Jersey in the month of May, and there they remain a few weeks. I once saw a large flock of them near Charleston, in the month of December, and I have found them in the Boston market in September. None were ever seen by me in any part of the interior, where, indeed, it is probable they very seldom make their appearance. As I have nothing of any importance to add, I shall present you with a few extracts from WILSON and NUTTALL, both of whom have had opportunities of observing this species.

"The Short-billed Curlew," says the former, "arrives in large flocks on the sea-coast of New Jersey early in May, from the south, frequents the salt-marshes, muddy shores and inlets, feeding on small worms and minute shell-fish. They are most commonly seen on mud-flats at low water, in company with various other waders; and at high water roam along the marshes. They fly high, and with great rapidity. A few are seen in June, and as late as the beginning of July, when they generally move off toward the north. Their

Nº 72
Pl. 356
Hudsonian Curlew
Male
Drawn from Nature by J.J. Audubon F.R.S.F.L.S.
Lith^d Printed & Col^d by J. T. Bowen, Philad^a

appearance on these occasions is very interesting: they collect together from the marshes as if by premeditated design, rise to a great height in the air, usually an hour before sunset, and, forming in one vast line, keep up a constant whistling on their way to the north, as if conversing with one another to render the journey more agreeable. Their flight is then more slow and regular, that the feeblest may keep up with the line of march; while the glittering of their beautifully speckled wings, sparkling in the sun, produces altogether a very pleasing spectacle.

"In the month of June, while the dewberries are ripe, these birds sometimes frequent the fields, in company with the Long-billed Curlews, where brambles abound; soon get very fat, and are at that time excellent eating."

Nuttall says, "From the middle of August to the beginning of September, they arrive in the vicinity of Massachusetts' Bay, and other parts of New England, frequenting the pastures as well as marshes, and fatten on grasshoppers and berries, till the time of their departure, about the close of September; and they wholly disappear from New Jersey, on their way to the south, early in the month of November."

I have only to add, that, having compared specimens of the present species with the Whimbrel of Europe, *Numenius Phæopus*, I am satisfied that they are perfectly distinct:

Esquimaux Curlew, *Scolopax borealis*, Wils. Amer. Orn., vol. vii. p. 92.

Numenius hudsonicus, Bonap. Syn., p. 314.

Numenius hudsonicus, *Hudsonian Curlew*, Swains. and Rich., F. Bor. Amer., vol. ii. p. 377.

Esquimaux Curlew, *Numenius hudsonicus*, Nutt. Man., vol. ii. p. 97.

Hudsonian Curlew, *Numenius hudsonicus*, Aud. Orn. Biog., vol. iii. p. 283; vol. v. p. 589.

Male, 18, 33.

Passes from Texas northward, returning in autumn. Abundant in the middle districts at both periods. Breeds at Hudson's Bay, and farther north.

Adult Male.

Bill much longer than the head, very slender, sub-cylindrical, compressed, slightly arched. Upper mandible with the dorsal line slightly arched, the sides, excepting at the base, rounded, and marked with a narrow groove extending more than two-thirds of its length, the ridge rather flattened at the base, convex and narrower towards the end, the edges rather obtuse. Nostrils basal, lateral, longitudinal, linear. Lower mandible with the dorsal line arched, or nearly parallel to that of the upper, the angle extremely narrow and extended to near the end, the sides at the base nearly erect, with a shallow groove close to the rather obtuse edge; the tips obtuse, and about equal in length.

Head rather small, oblong, compressed. Neck rather long, slender. Body rather full. Feet of moderate length, slender. Tibia bare a considerable way above the joint; tarsus with numerous anterior scutella, excepting in its upper fourth, where, and on the sides, it is reticulated. Toes small, scutellate above; first very small, second and fourth about equal, third considerably longer; the anterior toes marginate, and connected at the base by short webs, of which the outer is larger. Claws small, compressed, obtuse, that of middle toe much larger, curved outwards, with a sharp dilated inner edge.

Plumage soft and blended, on the fore part of the head very short; the feathers in general small, oblong or ovate, and rounded. Wings rather long, very acute, narrow, the primaries tapering, the first longest, the second a little shorter, the rest regularly and rapidly graduated; secondaries short, incurved, rounded, excepting some of the inner, which are greatly elongated and tapering. Tail short, rounded, of twelve rounded feathers.

Bill brownish-black, the basal half of lower mandible flesh-colour. Iris dark brown. Feet greyish-blue, claws black. The upper part of the head is deep brown, with a central longitudinal line of white, and a broader lateral one of the same over each eye; a brown line from the bill to the eye, and another extending behind the latter. The neck all round is pale yellowish-grey, longitudinally streaked with brown, excepting the chin or upper part of the throat, which is greyish-white. The upper parts in general are blackish-brown, marked with numerous spots of brownish-white, there being several along the margins of each feather; the wings and rump are lighter, the upper tail-coverts and tail barred with brown and yellowish-grey, the latter tipped with white. Primaries and their coverts brownish-black, the outer unspotted on their outer web; all the transverse light markings on the inner; the secondaries like the smaller coverts. Breast and abdomen greyish-white, the sides tinged with cream-colour, and barred with pale greyish brown; the outer lower tail-coverts with a few brown marks.

Length to end of tail 19 inches, to end of wings 18, to end of claws 21; wing from flexure 9¼; tail 4; extent of wings 33; bill along the back 4¼, along the edge of lower mandible 4½; tarsus $2\frac{4}{12}$, middle toe $1\frac{5}{12}$, its claw $\frac{11}{12}$. Weight 1 lb. 1¼ oz.

The Female resembles the male.

The bill varies greatly in length: in a specimen now before me, it is $2\frac{11}{12}$, in another $2\frac{9}{12}$, while in the individual figured it was 4¼.

Dimensions of a male:—From point of bill to end of tail 18 inches, to end of wing 18, to end of claws $19\frac{3}{12}$; extent of wings 33; bill $3\frac{7}{12}$, along the edge of lower mandible $3\frac{7}{12}$; bare part of tibia 1¼ inches; tarsus 2¼ inches, hind toe 5 twelfths, its claw 3 twelfths; second toe $1\frac{1}{12}$, its claw $\frac{3}{12}$; third

Esquimaux Curlew

1. Male 2. Female

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

toe 1$\frac{4}{12}$, its claw $\frac{4}{12}$; fourth toe 1$\frac{4}{12}$, its claw 2$\frac{2}{4}$ twelfths; wing from flexure 9$\frac{2}{4}$; tail 3$\frac{1}{12}$.

The heart and liver are very large, as in the other species, the right lobe of the latter passes under and beyond the stomach, and is 3 inches in length, the left lobe 1 inch 9 twelfths. The mouth is in all respects as in the preceding species, as is the tongue, which is 1 inch long. The œsophagus is 7 inches long, at the upper part 8 twelfths in width, afterwards uniformly 5 twelfths; the proventriculus large, 8 twelfths in width. The stomach is of moderate size, roundish, 1$\frac{1}{2}$ inches long, 1 inch 5 twelfths in breadth; its muscles of moderate thickness; the epithelium thick, horny, with two broad longitudinal plates on each side. Its contents are small crabs. Intestine 30 inches long, its width in the duodenal portion 4 twelfths, and nearly the same throughout, but at the distance of 10 inches from the end enlarging to 6 twelfths. Cœca 2$\frac{1}{2}$ inches from the extremity, 1 inch 9 twelfths long, 1$\frac{1}{4}$ twelfths in width, with the tip slender as in the other species.

Trachea 5$\frac{1}{4}$ inches long, 3$\frac{1}{4}$ twelfths broad at the top, 2 twelfths at the lower part, very little flattened; the rings firm, 122, with two dimidiate rings. Bronchi moderately wide, of about 18 half rings. Lateral muscles of moderate strength; the sterno-tracheales come off at the distance of 5 twelfths from the extremity; there is a very slender slip of muscle on each side going to the first bronchial ring.

ESQUIMAUX CURLEW.

NUMENIUS BOREALIS, *Lath.*

PLATE CCCLVII.—MALE AND FEMALE.

I regret that I am unable to present a complete history of the Esquimaux Curlew. It is true I might somewhat enlarge my account of its habits, were I to borrow from others, but as I have resolved to confine myself to the results of my own observation, unless in certain cases, in which I always take care to give my authorities, I hope you will be pleased with the little which I have to offer.

Previous to my voyage to Labrador, I had seen only a single bird of this

species which was kindly given me by my learned friend WILLIAM OAKES, Esq., of Ipswich, Massachusetts, who had procured it in his immediate neighbourhood, where, as I have since ascertained, the Esquimaux Curlew spends a few days in early autumn, while on its way southward. During their short stay in that State, they are met with on the high sandy hills near the seashore, where they feed on the grasshoppers and on several kinds of berries. On this food they become fat, so as to afford excellent eating, in consequence of which they have probably acquired the name of "Dough-bird," which they bear in that district, but which is also applied to several other birds. How this species manages to cross the whole extent of the United States without being seen after leaving Massachusetts, is to me very wonderful. On one occasion only have I ever had a glimpse of it. I was in company with my learned and generous friend JOHN BACHMAN of Charleston, on one of the islands on the coast of South Carolina, whither we had gone with the view of watching the Long-billed Curlews (*Numenius longirostris*). It was at the dawn of a fine day, when a dense flock of the northern Curlews passed to the southward, near enough to enable us to ascertain the species, but so swiftly, that in a few minutes they were quite out of sight.

On the 29th of July, 1833, during a thick fog, the Esquimaux Curlews made their first appearance in Labrador, near the harbour of Bras d'Or. They evidently came from the north, and arrived in such dense flocks as to remind me of the Passenger Pigeons. The weather was extremely cold as well as foggy. For more than a week we had been looking for them, as was every fisherman in the harbour, these birds being considered there, as indeed they are, great delicacies. The birds at length came, flock after flock, passed close round our vessel, and directed their course toward the sterile mountainous tracts in the neighbourhood; and as soon as the sun's rays had dispersed the fogs that hung over the land, our whole party went off in search of them.

I was not long in discovering that their stay on this coast was occasioned solely by the density of the mists and the heavy gales that already gave intimation of the approaching close of the summer; for whenever the weather cleared up a little, thousands of them set off and steered in a straight course across the broad Gulf of St. Lawrence. On the contrary, when the wind was high, and the fogs thick, they flew swiftly and low over the rocky surface of the country, as if bewildered. Wherever there was a spot that seemed likely to afford a supply of food, there the Curlews abounded, and were easily approached. By the 12th of August, however, they had all left the country.

In Labrador they feed on what the fishermen call the Curlew-berry, a small black fruit growing on a creeping shrub, not more than an inch or two

in height, and so abundant, that patches of several acres covered the rocks here and there. When the birds were in search of these feeding-grounds, they flew in close masses, sometimes high, at other times low, but always with remarkable speed, and performing beautiful evolutions in the air. The appearance of man did not seem to intimidate them, for they would alight so near us, or pass over our heads at so short a distance, that we easily shot them. While on wing, they emitted an oft repeated soft whistling note, but the moment they alighted they became silent. They ran swiftly along, all in the same direction, picking up the berries in their way, and when pursued, would immediately squat in the manner of a Snipe or Partridge, sometimes even laying their neck and head quite flat on the ground, until you came within a short distance, when, at the single whistle of any one of the flock, they would all immediately scream and fly off, rambling about for awhile, and not unfrequently re-alighting on the same spot. Now and then, however, their excursion would last a long time, they would rise high in the air, make towards the sea, and, as if aware of the unfavourable state of the weather for pursuing their southward course, would return.

They continued to arrive at Bras d'Or for several days, in flocks which seemed to me to increase in number. I saw no Hawks in their rear, and I was the more astonished at this, that at that period Pigeon Hawks and other species were pretty abundant.

They rose from the ground by a single quick spring, in the manner of a Snipe, when they would cut backward, forward, and all around, in a very curious manner, and would now and then pause in the air, like a Hawk, remaining stationary for a few moments with their head meeting the wind, when immediately afterwards they would all suddenly alight. In calm and fair weather, they were more shy than at other times. While on their passage across the Gulf, they flew high in close bodies, and with their usual speed by no means in regular lines, nor in any order, but much in the manner of the Migratory Pigeon, now and then presenting a broad front, and again coming together so as to form a close body.

Those which we procured were extremely fat and juicy, especially the young birds, of which we ate a good many. Mr. JONES, an old settler of Bras d'Or, and his son, shoot a great number every season, which they salt for winter food. They informed us that these birds pass over the same tract about the middle of May, on their way northward, and that they never found them breeding in their neighbourhood. Little difference could be observed at that season between them ales and females, or between the old and young birds.

NUMENIUS BOREALIS, Bonap. Syn., p. 314.

NUMENIUS BOREALIS, *Esquimaux Curlew*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 378.

Esquimaux Curlew, *Numenius borealis*, Nutt. Mann., vol. ii. p. 101.
Esquimaux Curlew, *Numenius borealis*, Aud. Orn. Biog., vol. iii. p. 69; vol. v. p. 590.

Male, 14½, 27⅜.

Passes in spring from Texas along the coast eastward to the Fur Countries, returning in autumn. Abundant at times in the Middle Atlantic Districts. Rarely seen in the interior. Breeds in the northern barren grounds.

Adult Male.

Bill much longer than the head, very slender, sub-cylindrical, compressed, slightly arched. Upper mandible with the dorsal line slightly arched, the sides, excepting at the base, nearly perpendicular, and marked with a narrow groove extending more than two-thirds of its length, edges rather obtuse. Nostrils basal, lateral, longitudinal, elliptical. Lower mandible with the dorsal line arched, the angle extremely narrow and extended to near the end, the sides convex, the edges rather obtuse, the tips obtuse, that of the upper mandible longer.

Head rather small, oblong, compressed. Neck rather long, slender. Body slender. Feet of moderate length, slender. Toes small; first very small, second and fourth about equal, third considerably longer. Claws small, compressed, blunt, that of middle toe much longer, curved outwards, with a sharp dilated inner edge.

Plumage soft and blended, on the fore part of the head very short. Wings rather long, very acute, narrow, the first quill longest, the second a little shorter, the rest regularly and rapidly graduated; secondaries short, incurved, rounded, excepting some of the inner, which are greatly elongated and tapering. Tail short, nearly even, of twelve rounded feathers.

Bill brownish-black, the lower mandible flesh-coloured at the base. Iris dark brown. Feet greyish-blue, claws black. The upper part of the head is brownish-black, streaked with pale yellowish-brown, and having an indistinct central line of the latter. The back is also brownish-black, marked with numerous spots of light brownish-yellow, there being several along the margin of each feather. Wing-coverts and secondaries of a lighter brown, similarly spotted; alula, primary coverts and quills unspotted, the shafts of most of the latter pale brown, but of the outer white. Tail pale greyish-brown, with light deep brown bars, and tipped with brownish-white. Sides of the head, and the neck all round, pale yellowish-brown, striped with dark brown; breast and sides of the same tint, with longitudinal and transverse dark markings. Lower wing-coverts and lower tail-coverts similarly barred; axillar feathers regularly banded, and of a deeper tint. Abdomen without markings. Throat and a line over the eye nearly white.

Length to end of tail 14½, to end of wings 14⅞, to end of claws 16¾; wing

from flexure 8½, tail 3¼; extent of wings 27⅝; bill along the back 2¼, along the edge 2½; tarsus 1 1/16, middle toe 1 1/16, its claw ⅜. Weight ½ lb.

Adult Female.

The female resembles the male, and is scarcely inferior in size.

The mouth is similar to that of the preceding species. Tongue 1 inch long. Œsophagus 6¼ inches long, ½ inch wide at the upper part, 5 twelfths in the rest of its extent; the proventriculus 6 twelfths in breadth. Stomach roundish, 1⅓ inches long, 1 inch 2½ twelfths broad; the lateral muscles moderate; the epithelium thick, reddish-brown, as in the other species, but with numerous longitudinal rugæ. Contents of stomach, remains of insects, seeds, and small pieces of quartz. Intestine 28 inches long; its width in the duodenal portion 3½ twelfths, so continuing until 7 inches from the extremity, when it enlarges to 5 twelfths. Cœca 3 inches from the end, 2¾ inches in length, of the uniform width of 1 twelfth, and slightly pointed. Trachea 4 inches 8 twelfths long, its width from 3 twelfths to 2 twelfths, considerably flattened; the rings 115, firm, with 2 additional dimidiate rings. Bronchial half rings about 18, extremely feeble. Muscles as in the last species.

FAMILY XXXVII.—TANTALINÆ. IBISES.

Bill very long, arcuate, rather stout at the base, obtuse. Nostrils basal, linear or oblong. Head bare in front, rather large or of moderate size; neck long and slender; body ovate. Legs long and rather stout; tibia bare to a large extent; tarsus reticulate, sometimes scaly in front; toes four, articulated on the same level, the anterior webbed at the base, the first more slender. Claws arched, compressed, rather obtuse. Wings long and very broad, with the second quill longest. Tail short, of twelve feathers. Tongue triangular, extremely short, flat, and thin. Œsophagus wide; stomach large, muscular, broadly elliptical, with the epithelium dense, longitudinally rugous; intestines generally of moderate length and width, cœca very small; cloaca globular. Trachea without inferior laryngeal muscles.

Genus I.—IBIS, *Cuv.* IBIS.

Bill very long, slender, higher than broad, compressed, tapering, arched, obtuse; upper mandible with the dorsal line arched in its whole length, the ridge convex, broader towards the end, the sides at the base erect, towards the end very convex and narrow, separated in their whole length from the ridge by a deep narrow groove, the edges inflected and sharp; lower mandible more slender, its angle very narrow, and protracted in the form of a groove to the tip. Nostrils basal, dorsal, linear. Head small, compressed, oblong, bare before the eyes; neck long and slender; body rather slender. Feet very long, slender; tarsi scutellate; anterior toes connected by membranes at the base. Claws rather small, slightly arched, pointed. Wings long, ample, with the second quill longest. Tail short, nearly even, of twelve feathers. Œsophagus wide, like that of a Heron; stomach muscular.

GLOSSY IBIS.

Ibis Falcinellus, *Linn.*

PLATE CCCLVIII.—Male.

The first intimation of the existence of this beautiful species of Ibis within the limits of the United States is due to Mr. George Ord, of Philadelphia, the friend and companion of the celebrated Alexander Wilson. It was described by him in the first volume of the Journal of the Academy of Natural Sciences of Philadelphia. He states that "on the seventh of May of the present year (1817), Mr. Thomas Say received from Mr. Oram, of Great Egg Harbour, a fine specimen of *Tantalus*, which had been shot there. It is the first instance which has come to my knowledge of this

Glossy Ibis.

Adult Male.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. Lith.d Printed & Col.d by J.T.Bowen, Philad.a

species having been found in the United States. I was informed that a recent specimen of this bird was, likewise in the month of May, presented to the Baltimore Museum, and that two individuals were killed in the district of Columbia." In the sequel Mr. ORD compares it with Dr. LATHAM'S account of the *Tantalus Mexicanus* of that author, and conjectures that it is the same.

It is not a little curious to see the changes of opinion that have taken place within these few years among naturalists who have thought of comparing American and European specimens of the birds which have been alleged to be the same in both continents. The Prince of MUSIGNANO, for example, who has given a figure of the very individual mentioned by Mr. ORD, thought at the time when he published the fourth volume of his continuation of WILSON'S American Ornithology, that our Glossy Ibis was the one described by the older European writers under the name of *Ibis Falcinellus*. Now, however, having altered his notions so far as to seem desirous of proving that the same species of bird cannot exist on both the continents, he has latterly produced it anew under the name of *Ibis Ordi*. This new name I cannot with any degree of propriety adopt. I consider it no compliment to the discoverer of a bird to reject the name which he has given it, even for the purpose of calling it after himself.

The Glossy Ibis is of exceedingly rare occurrence in the United States, where it appears only at long and irregular intervals, like a wanderer who has lost his way. It exists in Mexico, however, in vast numbers. In the spring of 1837, I saw flocks of it in Texas; but even there it is merely a summer resident, associating with the White Ibis, along the grassy margins of the rivers and bayous, and apparently going to and returning from its roosting places in the interior of the country. Its flight resembles that of its companion, the White Ibis, and it is probable that it feeds on the same kinds of crustaceous animals, and breeds on low bushes in the same great associations as that species, but we unfortunately had no opportunity of verifying this conjecture. Mr. NUTTALL, in his Ornithology of the United States and Canada, says that "a specimen has occasionally been exposed for sale in the market of Boston."

I have given the figure of a male bird in superb plumage, procured in Florida, near a wood-cutter's cabin, a view of which is also given.

IBIS FALCINELLUS, Bonap. Syn., p. 312.
BAY or GLOSSY IBIS, Nutt. Man., vol. ii. p. 88.
GLOSSY IBIS, *Ibis Falcinellus*, Aud. Orn. Biog., vol. iv. p. 608.

Male, 25, 42; wing, 11¼

Rare or accidental in the Middle Atlantic Districts; more common in

South Florida and Texas, where it breeds. Rarely seen far inland. Migratory.

Adult Male.

Bill very long, slender, higher than broad, compressed, tapering, acute, obtuse. Upper mandible with the dorsal line arched in its whole length, the ridge convex, broader towards the end, the sides at the base nearly erect, towards the end very convex and narrow, the ridge separated in its whole length from the sides by a deep narrow groove, the edges inflected and sharp. Nostrils basal, dorsal, linear, direct. Lower mandible more slender than the upper, its angle very narrow, and protracted in the form of a groove to the tip, the sides convex, the edges sharp, but strong and closely approximated, bearing only a very narrow groove between them.

Head small, compressed, oblong; neck long and slender; body slender, deeper than broad; wings rather large. Feet very long, slender; tibia long, bare about half its length, and covered all round with hexagonal scales; tarsi long, slender, anteriorly covered with numerous broad scutella, laterally with angular scales, beneath flattened, with thick soft margins; the anterior connected at the base by membranes, of which the outer is large; claws rather small, slightly arched, compressed, tapering, pointed, that of the middle toe with a sharp thin edge.

There is a bare space margining the forehead, occupying the part before the eye, and extending a little beyond it. Feathers of the head and neck slender lanceolate; those of the former glossy and compact, of the latter blended, as are those of the breast and abdomen, which are ovate. The upper parts highly glossed, with silky lustre, the feathers generally ovate and rounded. Wings long, ample, the first primary a quarter of an inch shorter than the second, which is two-twelfths longer than the third, the rest moderately graduated; the first sinuate on the inner web near the end, the second less deeply so; some of the inner secondaries elongated, but rounded, and when the wing is closed an inch and ten-twelfths shorter than the longest primary. Tail short, very slightly emarginate, of twelve rounded feathers.

Bill black; bare part of the head greyish-blue; iris hazel; feet greyish-black, claws brown. The upper part and sides of the head are dark glossy, with purplish reflections. The neck, a portion of the back anteriorly, the breast, abdomen, and legs, are of a deep rich brownish-red or dark chestnut; part of the breast shaded with green, the sides dusky, tinged with green, as are the lower wing-coverts, and lower tail-coverts. Excepting the anterior edge of the wing, and the anterior scapulars, which are deep glossy brownish-red, the upper parts are splendent dark green, glossed with purple; the primaries black, shaded with green; the tail glossy with purple reflections.

Length to end of tail 25 inches; to end of claws 30½; bill along the ridge

№ 72
Pl. 359.
1
2
Drawn from Nature by J.J.Audubon F.R.S.F.L.S.
Scarlet Ibis
1. Adult male 2. Young second Autumn
Lith.d Printed & Col.d by J. T. Bowen. Philad.a

$5\frac{4}{12}$, along the edge of lower mandible $5\frac{2}{12}$; wing from flexure $11\frac{3}{4}$; tail $4\frac{1}{4}$; bare part of tibia $2\frac{1}{2}$; hind toe $1\frac{1}{12}$, its claw $\frac{4}{12}$; second toe $1\frac{1}{12}$, its claw $\frac{4}{12}$; third toe $2\frac{8}{12}$, its claw $\frac{7}{12}$; fourth toe $2\frac{4}{12}$, its claw $\frac{5}{12}$.

The Female is similar to the male, but somewhat less.

The young in its second plumage has the bill dusky, tinged with yellow, the bare part of the head dusky; the feet blackish-brown, the head, neck, and lower parts are greyish-brown; the head and greater part of the neck marked with small longitudinal streaks of white, of which there are two on each feather. All the upper parts are blackish-green, glossy in a less degree than those of the adult.

On comparing adult American specimens with others obtained on the old continent, I can perceive no difference between them. A young Mexican bird, and one from India, are also precisely similar. I cannot therefore entertain a doubt as to the identity of our bird with the *Tantalus Falcinellus* of LATHAM and other European writers, which has been shown by SAVIGNY to be the Black Ibis of the ancients.

SCARLET IBIS.

IBIS RUBRA, *Linn.*

PLATE CCCLIX.—ADULT MALE AND YOUNG.

It was supposed by WILSON, and since his time by others, that this brilliantly coloured Ibis is not uncommon in the southern parts of the United States. This opinion, however, is quite erroneous, and I have found the Scarlet Ibis less numerous than even the Glossy Ibis; indeed I have not met with more than three individuals in a state of liberty, in the whole range of the United States. These birds occurred at Bayou Sara, in Louisiana, on the 3d of July, 1821. They were travelling in a line, in the manner of the White Ibis, above the tops of the trees. Although I had only a glimpse of them, I saw them sufficiently well to be assured of their belonging to the present species, and therefore I have thought it proper to introduce it into our Fauna. WILSON'S figure, I believe, was taken from a living specimen, not, however, procured within the limits of the United States, and which

was kept for some time in Peale's Museum in Philadelphia. My drawing of the adult male, and that of the immature bird, were made from specimens also procured beyond our limits. It is said that the habits of this bird are very similar to those of the White Ibis, of which I give you a long account; but, as I have not had opportunities of observing them, I judge it better to abstain from offering any remarks on this subject.

Scarlet Ibis, *Tantalus ruber*, Wils. Amer. Orn., vol. viii. p. 41.
Ibis rubra, Bonap. Syn., p. 311.
Scarlet Ibis, Nutt. Man., vol. ii. p. 84.
Scarlet Ibis, *Ibis rubra*, Aud. Orn. Biog., vol. v. p. 62.

Adult, 29; wing, 11¼.

Accidental. Three specimens seen by me in Louisiana.

Bill, feet, and bare parts of head, pale lake; plumage bright scarlet, excepting the quills, which are white, and the terminal portion of the outer four primaries, which are bluish-black. Young in first plumage with the bill and feet brownish grey, the bare parts of the head pale flesh-colour; plumage of head, neck, and upper parts, brownish-grey, of lower, white.

THE WHITE IBIS.

Ibis alba, *Linn.*

PLATE CCCLX.—Adult Male and Young.

Sandy Island is remarkable as a breeding-place for various species of water and land birds. It is about a mile in length, not more than a hundred yards broad, and in form resembles a horse-shoe, the inner curve of which looks toward Cape Sable in Florida, from which it is six miles distant. At low water, it is surrounded to a great distance by mud-flats abounding in food for wading and swimming birds, while the plants, the fruits, and the insects of the island itself, supply many species that are peculiar to the land. Besides the White Ibis, we found breeding there the Brown Pelican, the Purple, the Louisiana, the White, and the Green Herons, two species of Gallinule, the Cardinal Grosbeak, Crows, and Pigeons. The vegetation con

White Ibis.

Drawn from Nature by J. J. Audubon F.R.S.F.L.S.

1. Adult. 2. Young in Autumn.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

sists of a few tall mangroves, thousands of wild plum trees, several species of cactus, some of them nearly as thick as a man's body, and more than twenty feet high, different sorts of smilax, grape-vines, cane, palmettoes, Spanish bayonets, and the rankest nettles I ever saw, all so tangled together, that I leave you to guess how difficult it was for my companions and myself to force a passage through them in search of birds' nests, which, however, we effected, although the heat was excessive, and the stench produced by the dead birds, putrid eggs, and the natural effluvia of the Ibises, was scarcely sufferable. But then, the White Ibis was there, and in thousands; and, although I already knew the bird, I wished to study its manners once more, that I might be enabled to present you with an account of them, which I now proceed to do,—endeavouring all the while to forget the pain of the numerous scratches and lacerations of my legs caused by the cactuses of Sandy Island.

As we entered that well-known place, we saw nests on every bush, cactus, or tree. Whether the number was one thousand or ten I cannot say, but this I well know—I counted forty-seven on a single plum-tree. These nests of the White Ibis measure about fifteen inches in their greatest diameter, and are formed of dry twigs intermixed with fibrous roots and green branches of the trees growing on the island, which this bird easily breaks with its bill; the interior, which is flat, being finished with leaves of the cane and some other plants. The bird breeds only once in the year, and the full number of its eggs is three. They measure two inches and a quarter in length, with a diameter of one inch and five-eighths, are rough to the touch, although not granulated, of a dull white colour, blotched with pale yellow, and irregularly spotted with deep reddish-brown. They afford excellent eating, although when boiled they do not look inviting, the white resembling a livid-coloured jelly, and the yolk being of a reddish-orange, the former wonderfully transparent, instead of being opaque like that of most other birds. The eggs are deposited from the 10th of April to the 1st of May, and incubation is general by the 10th of the latter month. The young birds, which are at first covered with thick down of a dark grey colour, are fed by regurgitation. They take about five weeks to be able to fly, although they leave the nest at the end of three weeks, and stand on the branches, or on the ground, waiting the arrival of their parents with food, which consists principally of small fiddler crabs and cray-fish. On some occasions, I have found them at this age miles away from the breeding-places, and in this state they are easily caught. As soon as the young are able to provide for themselves, the old birds leave them, and the different individuals are then seen searching for food apart. While nestling or in the act of incubation, these Ibises are extremely gentle and unwary, unless they may have been much

disturbed, for they almost allow you to touch them on the nest. The females are silent all the while, but the mates evince their displeasure by uttering sounds which greatly resemble those of the White-headed Pigeon, and which may be imitated by the syllables *crooh, croo, croo.* The report of a gun scarcely alarms them at first, although at all other periods these birds are shy and vigilant in the highest degree.

The change in the colouring of the bill, legs, and feet of this bird, that takes place in the breeding-season, is worthy of remark, the bill being then of a deep orange-red, and the legs and feet of a red nearly amounting to carmine. The males at this season have the gular pouch of a rich orange-colour, and somewhat resembling in shape that of the Frigate Pelican, although proportionally less. During winter, these parts are of a dull flesh-colour. The irides also lose much of their clear blue, and resume in some degree the umber colour of the young birds. I am thus particular in these matters, because it is doubtful if any one else has ever paid attention to them.

While breeding, the White Ibises go to a great distance in search of food for their young, flying in flocks of several hundreds. Their excursions take place at particular periods, determined by the decline of the tides, when all the birds that are not sitting go off, perhaps twenty or thirty miles, to the great mud flats, where they collect abundance of food, with which they return the moment the tide begins to flow. As the birds of this genus feed by night as well as by day, the White Ibis attends the tides at whatever hour they may be. Some of those which bred on Sandy Key would go to the keys next the Atlantic, more than forty miles distant, while others made for the everglades; but they never went off singly. They rose with common accord from the breeding-ground, forming themselves into long lines, often a mile in extent, and soon disappearing from view. Soon after the turn of the tide we saw them approaching in the same order. Not a note could you have heard on those occasions; yet if you disturb them when far from their nests, they utter loud hoarse cries resembling the syllables *hunk, hunk, hunk,* either while on the ground or as they fly off.

The flight of the White Ibis is rapid and protracted. Like all other species of the genus, these birds pass through the air with alternate flappings and sailings; and I have thought that the use of either mode depended upon the leader of the flock, for, with the most perfect regularity, each individual follows the motion of that preceding it, so that a constant appearance of regular undulations is produced through the whole line. If one is shot al this time, the whole line is immediately broken up, and for a few minutes all is disorder; but as they continue their course, they soon resume their former arrangement. The wounded bird never attempts to bite or to defend

itself in any manner, although, if only winged, it runs off with more speed than is pleasant to its pursuer.

At other times the White Ibis, like the Red and the Wood Ibises, rises to an immense height in the air, where it performs beautiful evolutions. After they have thus, as it were, amused themselves for some time, they glide down with astonishing speed, and alight either on trees or on the ground. Should the sun be shining, they appear in their full beauty, and the glossy black tips of their wings form a fine contrast with the yellowish-white of the rest of their plumage.

This species is as fond of resorting to the ponds, bayous, or lakes that are met with in the woods, as the Wood Ibis itself. I have found it breeding there at a distance of more than three hundred miles from the sea, and remaining in the midst of the thickest forests until driven off to warmer latitudes by the approach of winter. This is the case in the State of Mississippi, not far from Natchez, and in all the swampy forests around Bayou Sara and Pointe Coupé, as well as the interior of the Floridas. When disturbed in such places, these Ibises fly at once to the tops of the tallest trees, emitting their hoarse *hunk*, and watch your motions with so much care that it is extremely difficult to get within shot of them.

The manner in which this bird searches for its food is very curious. The Woodcock and the Snipe, it is true, are probers as well as it, but their task requires less ingenuity than is exercised by the White or the Red Ibis. It is also true that the White Ibis frequently seizes on small crabs, slugs and snails, and even at times on flying insects; but its usual mode of procuring food is a strong proof that cunning enters as a principal ingredient in its instinct. The cray-fish often burrows to the depth of three or four feet in dry weather, for before it can be comfortable it must reach the water. This is generally the case during the prolonged heats of summer, at which time the White Ibis is most pushed for food. The bird, to procure the cra y-fish walks with remarkable care towards the mounds of mud which the latter throws up while forming its hole, and breaks up the upper part of the fabric, dropping the fragments into the deep cavity that has been made by the animal. Then the Ibis retires a single step, and patiently waits the result. The cray-fish, incommoded by the load of earth, instantly sets to work anew, and at last reaches the entrance of its burrow; but the moment it comes in sight, the Ibis seizes it with his bill.

Whilst at Indian Key, I observed an immense quantity of beautiful tree snails, of a pyramidal or shortly conical form, some pure white, others curiously marked with spiral lines of bright red, yellow, and black. They were crawling vigorously on every branch of each bush where there was not a nest of the White Ibis; but wherever that bird had fixed its habitation,

not a live snail was to be seen, although hundreds lay dead beneath. Was this caused by the corrosive quality of the bird's ordure?

There is a curious though not altogether general difference between the sexes of this species as to the plumage:—the male has five of its primaries tipped with glossy black for several inches, while the female, which is very little smaller than the male, has only four marked in this manner. On examining more than a hundred individuals of each sex, I found only four exceptions, which occurred in females that were very old birds, and which, as happens in some other species, might perhaps have been undergoing the curious change exhibited by Ducks, Pheasants, and some other birds, the females of which, when old, sometimes assume the livery of the males.

Much, as you are aware, good reader, has been said respecting the "oil bags" of birds. I dislike controversy, simply because I never saw the least indications of it in the ways of the Almighty Creator. Should I err, forgive me, but my opinion is, that these organs were not made without an object. Why should they consist of matter so conveniently placed, and so disposed as to issue under the least pressure, through apertures in the form of well defined tubes? The White Ibis, as well as the Wood Ibis, and all the other species of this genus, when in full health, has these oil bags of great size, and, if my eyes have not deceived me, makes great use of their contents. Should you feel anxious to satisfy yourself on this subject, I request of you to keep some Ibises alive for several weeks, as I have done, and you will have an opportunity of judging. And again, tell me if the fat contained in these bags is not the very best *lip-salve* that can be procured.

When any species of Ibis with which I am acquainted falls into the water on being wounded, it swims tolerably well; but I have never observed any taking to the water and swimming either by choice or to escape pursuit. I chanced one morning to be on the look-out for White Ibises, in a swamp not many miles from Bayou Sara. It was in the end of summer, and all around was pure and calm as the clear sky, the bright azure of which was reflected by the lake before us. The trees had already exchanged the verdure of their foliage for more mellow tints of diversified hue; the mast dropped from the boughs; some of the Warblers had begun to think of removing farther south; the Night Hawk, in company with the Chimney Swallow, was passing swiftly towards the land of their winter residence, and the Ibises had all departed for the Florida coasts, excepting a few of the white species, one of which we at length espied. It was perched about fifty yards from us towards the centre of the pool, and as the report of one of our guns echoed among the tall cypresses, down to the water, broken winged, it fell. The exertions which it made to reach the shore seemed to awaken the half-torpid alligators that lay in the deep mud at the bottom of the pool. One

shewed his head above the water, then a second and a third. All gave chase to the poor wounded bird, which, on seeing its dreaded and deadly foes, made double speed towards the very spot where we stood. I was surprised to see how much faster the bird swam than the reptiles, who, with jaws widely opened, urged their heavy bodies through the water. The Ibis was now within a few yards of us. It was the alligator's last chance. Springing forward as it were, he raised his body almost out of the water; his jaws nearly touched the terrified bird; when pulling three triggers at once, we lodged the contents of our guns in the throat of the monster. Thrashing furiously with his tail, and rolling his body in agony, the alligator at last sunk to the mud; and the Ibis, as if in gratitude, walked to our very feet, and there lying down, surrendered itself to us. I kept this bird until the succeeding spring, and by care and good nursing, had the pleasure of seeing its broken wing perfectly mended, when, after its long captivity, I restored it to liberty, in the midst of its loved swamps and woods.

The young bird of this species, which I kept alive for some time, fed freely, after a few days' captivity, on soaked Indian corn meal, but evinced great pleasure when cray-fishes were offered to it. On seizing one, it beat it sideways on the ground, until the claws and legs were broken off, after which it swallowed the body whole. It was fond of lying on its side in the sun for an hour or so at a time, pluming its body and nursing the sore wing. It walked lightly and very gracefully, though not so much so as the Heron. It did not molest its companions, and became very gentle and tame, following those who fed it like a common fowl.

The Creoles of Louisiana call this species "*Bec croche,*" and also "*Petit Flaman,*" although it is also generally known by the name of "Spanish Curlew." The flesh, which, as well as the skin, is of a dull orange-colour, is extremely fishy, although the birds are often sold in our southernmost markets, and are frequently eaten by the Indians.

The White Ibis has been shot eastward as far as New Jersey. Of this I have been made aware by my generous friend EDWARD HARRIS, Esq. I never saw one farther up the Mississippi than Memphis.

WHITE IBIS, *Tantalus albus*, Wils. Amer. Orn., vol. viii. p. 43.
IBIS ALBA, Bonap. Syn., p. 312.
WHITE IBIS, Nutt. Man., vol. ii. p. 86.
WHITE IBIS, *Ibis alba*, Aud. Orn. Biog., vol. iii. p. 173; vol. v. p. 593.

Adult, 24½, 40.

Constant resident in South Florida, where it is abundant. Breeds along the coast to Texas, westward, and occasionally as far as New Jersey east-

ward, inland as far up the Mississippi as Natchez and Red river. Returns to the Floridas in autumn.

Adult Male.

Bill very long, slender, deeper than broad, compressed, tapering, arcuate, obtuse at the tip. Upper mandible with the dorsal line arched in its whole length, the ridge convex, broader towards the end, the sides at the base nearly erect, towards the end very convex and narrow, the ridge separated in its whole length from the sides by a deep narrow groove, the edges inflected and sharp. Nostrils basal, dorsal, linear, direct. Lower mandible nearly equal to upper, its angle very narrow, and protracted in the form of a groove to the tip, the sides convex, the edges sharp, but strong.

Head small, compressed; neck long and slender; body slender, deeper than broad; wings rather large. Feet very long, slender; tibiæ long, bare about half their length, and covered all round with hexagonal scales; tarsi long, slender, anteriorly covered with numerous broad scutella, the rest with hexagonal scales; toes slender, the first much smaller, the third longest, the fourth considerably shorter, the second very little shorter than the fourth, all covered above with numerous scutella, laterally with angular scales, beneath flattened, with thick soft margins; the anterior connected at the base by membranes, of which the outer is longer; claws small, arched, compressed, obtuse, the middle one with a sharp thin edge.

Head and throat bare to beyond the eyes, as are the tibiæ nearly half way up. Plumage in general soft, unglossed, the feathers rather blended, those of the head and neck narrow and more blended. Wings long, ample, some of the secondaries as long as the longest primary when the wings are closed; third quill longest, but second and fourth almost as long, first longer than fifth; secondaries broad and rounded. Tail short, slightly emarginate and rounded, of twelve rounded feathers.

Bare parts of the head light orange-red; bill the same, but towards the tip dusky. Iris of a fine pearly blue. Legs and toes paler than the bill; claws dusky, tipped with horn colour. Plumage pure white, excepting the ends of from three to five of the outer primaries, which are deep black, with blue and green reflexions.

Length to end of tail 24½ inches, to end of wings 27, to end of claws 31½; extent of wings 40; wing from flexure 12½; tail 4¾; bill along the back 5¼, along the edge 5¾; bare space of tibia 1¾, tarsus 3¼, middle toe 2⅛, its claw ⅝. Weight 2 lbs.

The adults vary considerably in size, and remarkably in the length of the bill. The extent of the bare space on the head varies according to age. In the breeding season the bill and legs are bright carmine; during the rest of the year paler.

Young bird killed in September.

In its first plumage this species is of a dull brown colour all over excepting the rump, which is whitish, and the tail, which is tinged with grey.

After the first moult, the bill is pale yellowish-orange, toward the base greenish; the naked parts of the head are pale orange-yellow, inclining to flesh-colour; the eye dark brown; the feet pale blue. The plumage is of a dull olivaceous-brown, the quills darker, the tail rather lighter, the hind part of the back white, the breast and abdomen white.

In a female preserved in spirits, the roof of the mouth is flattened, with an anterior median longitudinal ridge; and the two sides or crura of the lower mandible are united for more than half their length from the tip. The tongue is triangular, extremely short, being only 5½ twelfths in length, flat, and extremely thin, broadly emarginate and papillate at the base, the two lateral papillæ much larger, its upper surface covered with numerous small crypts, its tip obtusely pointed. The posterior aperture of the nares is linear, with an anterior slit. The mouth is rather narrow, being only 7 twelfths in width. The tongue and the general form of the mouth are thus similar to those of the Spoonbill; and the former is entirely different from that of the Curlews and Snipes, to which this genus approaches in the form of the bill. The aperture of the ear is remarkably small, its diameter being only 1½ twelfths.

The œsophagus, Fig. 1, *a b c d*, is 11 inches long, wide, like that of a Heron, its diameter varying from 1 inch to 1½ inches, being greater at the lower part of the neck, and contracting to 9 twelfths as it enters the thorax. The stomach, *d e f g*, is large, muscular, broadly elliptical, 2¾ inches long; 1 inch 10 twelfths in breadth; the lateral muscles strong, the inferior very large. The duodenum, *g h i*, curves in the usual manner, returning upon itself at the distance of 3¼ inches; its width 4½ twelfths. There is a small gall-bladder about ½ inch long, and two biliary ducts; beyond the entrance of which the intestine forms several convolutions, and preserves a nearly uniform width throughout. The rectum is 3 inches long, and the cœca, Fig. 2, *c c*, are reduced to the minimum size, being only 1½ twelfths in length. In this respect, as well as in the structure of the stomach, this bird differs entirely from the Heron, to which it approximates in the form of the œsophagus, although not in that of the tongue. The contents of the stomach are remains of cray-fish and aquatic insects. Its epithelium is thick, tough, longitudinally rugous, but not presenting two distinct grinding plates. The proventriculus, *c*, is 10 twelfths in breadth, and its glands are of a cylindrical form, about 2 twelfths long, with wide apertures. The length of the intestine is 3 feet 9 inches.

The trachea is 9½ inches long, of the nearly uniform breadth of 4 twelfths;

Fig. 1.

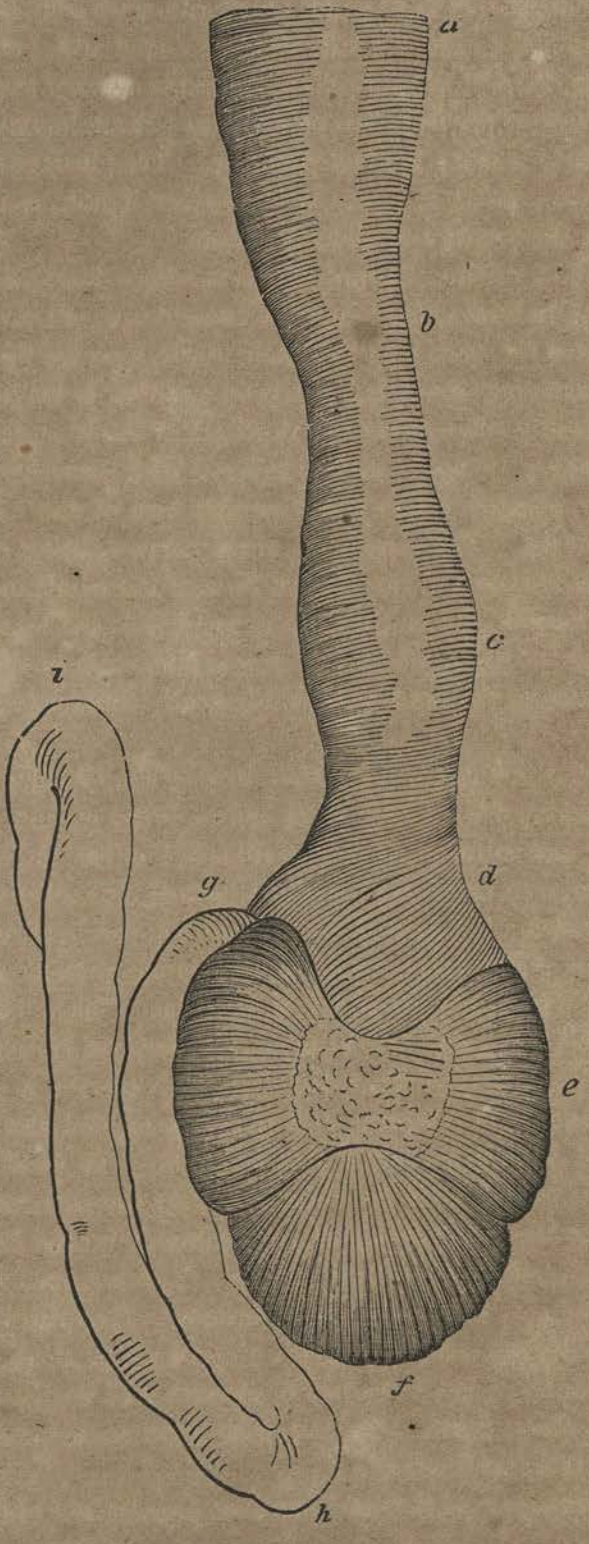


Fig. 2.

the rings 132, broad, but very thin and unossified. The bronchi are very short, of about 15 half rings. The lateral muscles are thin; the sterno-tracheal slips slender. There are no inferior laryngeal muscles.

The sternum approaches in form to that of the Heron, the ridge is very prominent, with its outline rounded; but the body differs in having two very distinct deep notches on each side posteriorly.

Genus II.—TANTALUS, *Linn.* TANTALUS.

Bill long, stout, at the base as wide as the face, deeper than broad, compressed, tapering towards the end, which is decurved; upper mandible with the ridge rather broad and flattened at the base, narrowed at the middle, convex toward the end, the sides sloping at the base, convex toward the end, the edges inflected and sharp, the tip declinate, rounded, with a notch on each side; nostrils basal, close to the ridge, direct, oblong; lower mandible with the angle rather wide, with a bare dilatable membrane, the edges erect and sharp, the tip blunted. Head of ordinary size, and with part of the hind neck bare and scurfy. Feet very long, like those of the Heron; tibia and tarsus reticulate; hind toe rather large, third longest; claws small, arched, that of the third toe not serrate. Wings long, ample, with the third quill longest. Tail of twelve broad rounded feathers.

THE WOOD IBIS.

TANTALUS LOCULATOR, *Linn.*

PLATE CCCLXI.—MALE.

This very remarkable bird, and all others of the same genus that are known to occur in the United States, are constant residents in some part of our Southern Districts, although they perform short migrations. A few of them now and then stray as far as the Middle States, but instances of this are rare; and I am not aware that any have been seen farther to the eastward than the southern portions of Maryland, excepting a few individuals of the Glossy and the White Ibises, which have been procured in Pennsylvania, New Jersey, and New York. The Carolinas, Georgia, the Floridas, Alabama, Lower Louisiana, including Opellousas, and Mississippi, are the districts to which they resort by preference, and in which they spend the whole year. With the exception of the Glossy Ibis, which may be looked upon as a bird of the Mexican territories, and which usually appears in the Union singly or in pairs, they all live socially in immense flocks, especially during the breeding season. The country which they inhabit is doubtless the best suited to their habits; the vast and numerous swamps, lagoons, bayous, and submersed savannahs that occur in the lower parts of our Southern States all abounding with fishes and reptiles; and the temperature of these countries being congenial to their constitutions.

In treating of the bird now under your notice, Mr. WILLIAM BARTRAM says, "This solitary bird does not associate in flocks, but is generally seen alone." This was published by WILSON, and every individual who has since written on the subject, has copied the assertion without probably having any other reason than that he believed the authors of it to state a fact. But the habits of this species are entirely at variance with the above quotation, to which I direct your attention not without a feeling of pain, being assured that Mr. BARTRAM could have made such a statement only because he had few opportunities of studying the bird in question in its proper haunts.

The Wood Ibis is rarely met with single, even after the breeding season, and it is more easy for a person to see a hundred together at any period of the year than to meet with one by itself. Nay, I have seen flocks composed of several thousands, and that there is a natural necessity for their

W.H.

Wood Ibis

Male

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. Lith.d Printed & Col.d by J.T.Bowen, Phila.a

flocking together I shall explain to you. This species feeds entirely on fish and aquatic reptiles, of which it destroys an enormous quantity, in fact more than it eats; for if they have been killing fish for half an hour and have gorged themselves, they suffer the rest to lie on the water untouched, when it becomes food for Alligators, Crows, and Vultures, whenever these animals can lay hold of it. To procure its food, the Wood Ibis walks through shallow muddy lakes or bayous in numbers. As soon as they have discovered a place abounding in fish, they dance as it were all through it, until the water becomes thick with the mud stirred from the bottom by their feet. The fishes, on rising to the surface, are instantly struck by the beaks of the Ibises, and, on being deprived of life, they turn over and so remain. In the course of ten or fifteen minutes, hundreds of fishes, frogs, young alligators, and water-snakes cover the surface, and the birds greedily swallow them until they are completely gorged, after which they walk to the nearest margins, place themselves in long rows, with their breasts all turned towards the sun, in the manner of Pelicans and Vultures, and thus remain for an hour or so. When digestion is partially accomplished, they all take to wing, rise in spiral circlings to an immense height, and sail about for an hour or more, performing the most beautiful evolutions that can well be conceived. Their long necks and legs are stretched out to their full extent, the pure white of their plumage contrasts beautifully with the jetty black of the tips of their wings. Now in large circles they seem to ascend toward the upper regions of the atmosphere; now, they pitch towards the earth; and again, gently rising, they renew their gyrations. Hunger once more induces them to go in search of food, and, with extended front, the band sails rapidly towards another lake or bayou.

Mark the place, reader, and follow their course through cane-brake, cypress-swamp, and tangled wood. Seldom do they return to the same feeding place on the same day. You have reached the spot, and are standing on the margin of a dark-watered bayou, the sinuosities of which lead your eye into a labyrinth ending in complete darkness. The tall canes bow to each other from the shores; the majestic trees above them, all hung with funereal lichen, gently wave in the suffocating atmosphere; the bullfrog, alarmed, shrinks back into the water; the alligator raises his head above its surface, probably to see if the birds have arrived, and the wily cougar is stealthily advancing toward one of the Ibises, which he expects to carry off into the thicket. Through the dim light your eye catches a glimpse of the white-plumaged birds, moving rapidly like spectres to and fro. The loud clacking of their mandibles apprises you of the havoc they commit among the terrified inhabitants of the waters. Move, gently or not, move at all and you infallibly lose your opportunity of observing the actions of the birds.

Some old male has long marked you; whether it has been with eye or with ear, no matter. The first stick your foot cracks, his hoarse voice sounds the alarm. Off they all go, battering down the bending canes with their powerful pinions, and breaking the smaller twigs of the trees, as they force a passage for themselves.

Talk to me of the stupidity of birds, of the dulness of the Wood Ibis! say it is fearless, easily approached, and easily shot. I listen, but it is merely through courtesy; for I have so repeatedly watched its movements, in all kinds of circumstances, that I am quite convinced we have not in the United States a more shy, wary, and vigilant bird than the Wood Ibis. In the course of two years spent, I may say, among them, for I saw some whenever I pleased during that period, I never succeeded in surprising one, not even under night, when they were roosting on trees at a height of nearly a hundred feet, and sometimes rendered farther secure by being over extensive swamps.

My Journal informs me, that, one autumn while residing near Bayou Sara, being intent on procuring eight or ten of these birds, to skin for my learned and kind friend the Prince of MUSIGNANO, I took with me two servants, who were first-rate woodsmen, and capital hands at the rifle, and that notwithstanding our meeting with many hundreds of Wood Ibises, it took us three days to shoot fifteen, which were for the most part killed on wing with rifle-balls, at a distance of about a hundred yards. On that occasion we discovered that a flock roosted regularly over a large corn-field covered with huge girted trees, the tops of which were almost all decayed. We stationed ourselves apart in the field, concealed among the tall ripened corn, and in silence awaited the arrival of the birds. After the sun had disappeared, the broad front of a great flock of Ibises was observed advancing towards us. They soon alighted in great numbers on the large branches of the dead trees; but whenever one of the branches gave way under their weight, all at once rose in the air, flew about several times, and alighted again. One of my companions, having a good opportunity, fired, and brought two down with a single bullet; but here the sport was ended. In five minutes after, not an Ibis was within a mile of the place, nor did any return to roost there for more than a month. When on the margin of a lake, or even in the centre of it—for all the lakes they frequent are exceedingly shallow—the first glimpse they have of a man induces them to exert all their vigilance; and should he after this advance a few steps, the birds fly off.

The name of "Wood Ibis" given to this bird, is not more applicable to it than to any other species; for every one with which I am acquainted resorts quite as much to the woods at particular periods. All our species may be found on wet savannahs, on islands surrounded even by the waters of the

sea, the Florida Keys for example, or in the most secluded parts of the darkest woods, provided they are swampy, or are furnished with ponds. I have found the Wood, the Red, the White, the Brown, and the Glossy Ibises around ponds in the centre of immense forests; and in such places, even in the desolate pine-barrens of the Floridas; sometimes several hundred miles from the sea coast, on the Red river, in the State of Louisiana, and above Natchez, in that of Mississippi, as well as within a few miles of the ocean. Yet, beyond certain limits, I never saw one of these birds.

One of the most curious circumstances connected with this species is, that although the birds are, when feeding, almost constantly within the reach of large alligators, of which they devour the young, these reptiles never attack them; whereas, if a Duck or a Heron comes within the reach of their tails, it is immediately killed and swallowed. The Wood Ibis will wade up to its belly in the water, round the edges of "alligators' holes," without ever being injured; but should one of these birds be shot, an alligator immediately makes towards it and pulls it under water. The gar-fish is not so courteous, but gives chase to the Ibises whenever an opportunity occurs. The snapping-turtle is also a great enemy to the young birds of this species.

The flight of the Wood Ibis is heavy at its rising from the ground. Its neck at that moment is deeply curved downward, its wings flap heavily but with great power, and its long legs are not stretched out behind until it has proceeded many yards. But as soon as it has attained a height of eight or ten feet, it ascends with great celerity, generally in a spiral direction, in silence if not alarmed, or, if frightened, with a rough croaking guttural note. When fairly on wing, they proceed in a direct flight, with alternate flappings and sailings of thirty or forty yards, the sailings more prolonged than the flappings. They alight on trees with more ease than Herons generally do, and either stand erect or crouch on the branches, in the manner of the Wild Turkey, the Herons seldom using the latter attitude. When they are at rest, they place their bill against the breast, while the neck shrinks as it were between the shoulders. In this position you may see fifty on the same tree, or on the ground, reposing in perfect quiet for hours at a time, although some individual of the party will be constantly on the look-out, and ready to sound the alarm.

In the spring months, when these birds collect in large flocks, before they return to their breeding places, I have seen thousands together, passing over the woods in a line more than a mile in extent, and moving with surprising speed at the height of only a few yards above the trees. When a breeding place has once been chosen, it is resorted to for years in succession; nor is it easy to make them abandon it after they have deposited their eggs, although, if much annoyed, they never return to it after that season.

Besides the great quantity of fishes that these Ibises destroy, they alsc devour frogs, young alligators, wood rats, young rails and grakles, fiddlers and other crabs, as well as snakes and small turtles. They never eat the eggs of the alligator, as has been alleged, although they probably would do so, could they demolish the matted nests of that animal, a task beyond the power of *any* bird known to me. I never saw one eat any thing which either it or some of its fellows had not killed. Nor will it eat an animal that has been dead for some time, even although it may have been killed by itself. When eating, the clacking of their mandibles may be heard at the distance of several hundred yards.

When wounded, it is dangerous to approach them, for they bite severely. They may be said to be very tenacious of life. Although usually fat, they are very tough and oily, and therefore are not fit for food. The negroes, however, eat them, having, previous to cooking them, torn off the skin, as they do with Pelicans and Cormorants. My own attempts, I may add, were not crowned with success. Many of the negroes of Louisiana destroy these birds when young for the sake of the oil which their flesh contains, and which they use in greasing machines.

The French Creoles of that State name them "Grans Flamans," while the Spaniards of East Florida know them by the name of "Gannets." When in the latter country, at St. Augustine, I was induced to make an excursion, to visit a large pond or lake, where I was assured there were Gannets in abundance, which I might shoot off the trees, provided I was careful enough. On asking the appearance of the Gannets, I was told that they were large white birds, with wings black at the end, a long neck, and a large sharp bill. The description so far agreeing with that of the Common Gannet or Solan Goose, I proposed no questions respecting the legs or tail, but went off. Twenty-three miles, reader, I trudged through the woods, and at last came in view of the pond; when, lo! its borders and the trees around it were covered with Wood Ibises. Now, as the good people who gave the information spoke according to their knowledge, and agreeably to their custom of calling the Ibises Gannets, had I not gone to the pond, I might have written this day that Gannets are found in the interior of the woods in the Floridas, that they alight on trees, &c., which, if *once* published, would in all probability have gone down to future times through the medium of compilers, and all perhaps without acknowledgment.

The Wood Ibis takes four years in attaining full maturity, although birds of the second year are now and then found breeding. This is rare, however, for the young birds live in flocks by themselves, until they have attained the age of about three years. They are at first of a dingy brown, each feather edged with paler; the head is covered to the mandibles with short downy

feathers, which gradually fall off as the bird advances in age. In the third year, the head is quite bare, as well as a portion of the upper part of the neck. In the fourth year, the bird is as you see it in the plate. The male is much larger and heavier than the female, but there is no difference in colour between the sexes.

Wood Ibis, *Tantalus Loculator*, Wils. Amer. Orn., vol. viii. p. 39.
Tantalus Loculator, Bonap. Syn., p. 310.
Wood Ibis, Nutt. Man., vol. ii. p. 82.
Wood Ibis, *Tantalus Loculator*, Aud. Orn. Biog., vol. iii. p. 128.

Male, 44½, 62; bill, 9.

Resident from Texas to North Carolina, in deep woody swamps; or fresh-water lakes, not on the sea-shores; breeds on trees in swamps; moves in large flocks. Up the Mississippi to Natchez. Abundant in Florida and Lower Louisiana.

Adult male.

Bill long, stout, at the base as wide as the face, deeper than broad, compressed, tapering towards the end, which is curved. Upper mandible with the dorsal line straight to near the end, then considerably curved, the ridge rather broad and flattened at the base, narrowed in the middle, convex towards the end, the sides sloping and rather flat at the base, towards the end rounded, the edges overlapping, inflected, sharp but strong, the tip declinate, narrow, rounded, with a notch on either side. Nostrils basal, close to the ridge, direct, pervious, oblong; no nasal groove. Lower mandible curved towards the end, like the upper, its angle rather wide, and having a bare dilatable membrane, the sides rather flat and erect at the base, afterwards narrowed and with the back rounded, the edges erect, sharp, with a groove externally for the insertion of those of the upper mandible.

Head of ordinary size, short, compressed. Neck long. Body rather slender, deeper than broad. Wings large. Feet very long, slender, like those of the Heron. Tibia long, slender, bare for one-half of its length; and with the long, compressed tarsus, covered all round with hexagonal scales. Toes rather long and slender, the first smallest, the second next in length, the third longest, the fourth intermediate between the second and third, all covered above with numerous scutella, laterally with angular scales, beneath flattened with soft margins, the anterior connected at the base by pretty large webs, of which the outer is larger. Claws small, rather compressed, rounded above, obtuse, the thin edge of that of the third not serrated.

The head all round, and the hind neck half way down, destitute of feathers, the skin wrinkled and covered with irregular scurfy scales Plumage in general rather loose, more so on the neck. Wings long,

ample, primaries strong, the third longest, second almost as long, fourth about the same length as third, first considerably shorter, all curved, emarginate, of twelve broad, rounded feathers.

Bill dusky yellowish-brown, the edges yellow. Sides of the head dark bluish-purple, upper part of the head horn-colour or dull greyish-yellow, the rest of the bare skin of the same tint, many of the scales anteriorly blue. Iris deep brown, at a distance seeming black. Tibia and tarsus indigo-blue. Toes above black, on the lateral and hind toes, however, many of the scutella bluish-grey; the webs pale yellowish flesh-colour; claws black.

The general colour of the plumage is pure white with a tinge of yellow. Alula, primary coverts, primary and secondary quills, excepting the inner, and tail black, with green and purplish-blue reflections, according to the light in which they are viewed.

Length to end of tail 44½ inches, to end of claws 59½, to end of wings 46½; wing from flexure 18; tail 6; extent of wings 62; bill along the back 9½, along the edge 9, its greatest depth 2½; bare part of tibia 6; tarsus 9; middle toe 4$\frac{5}{16}$, its claw $\frac{5}{8}$. Weight 11¾ lbs.

The Female is precisely similar to the male, differing merely in being smaller. Its weight is 9¼ lbs.

The Young are dusky-grey all over, the quills and tail brownish-black. The head all covered with down, excepting just at the base of the bill. After the first moult, the bare space extends over the head and cheeks; the downy feathers of the hind head and neck are dusky; the general colour of the plumage is white, the quills and tail nearly as in the adult, but with less gloss. A male of this description shot in January was in length 35 inches, its bill 7½, tarsus 7, middle toe 4, its claw ½; its weight 7¾ lbs.

When the Wood Ibis has caught a fish too large to be easily swallowed, it shakes its head in a violent manner, as if to force its prey down or drive it up again. In the latter case, it carries the fish to the shore, and breaks it into pieces, which it then swallows.

This species has the subcutaneous cellular tissue highly developed, especially along the breast, and the lower parts of the body, although not by any means so much so as in the Brown Pelican. I have represented a flock of these birds in the background, with the view of giving you an idea of the swamps to which they usually resort. They are on the edge of an alligator's hole, at their avocations. The trees clad with dangling mosses, afford evidence of the insalubrity of the atmosphere. You see the alligators with their heads and backs above water, watching the motions of the birds.

Genus III.—PLATALEA. *Linn.* SPOONBILL.

Bill very long, excessively depressed, being, when viewed laterally, very slender; but, when seen from above, nearly as broad as the head at the base, considerably contracted in the middle, and at the end expanded into a large obovate disk much broader than the head; upper mandible with the dorsal line almost straight, at the tip decurved, the ridge extremely broad and flat, gradually widening beyond the nostrils, at the end terminated by the very small, decurved, blunt unguis, the sides declinate at the base, horizontally flattened towards the end, separated in their whole length from the ridge by a narrow groove, their margins soft and blunt; lower mandible with the angle very long, narrow, rounded, the coma narrow, and gradually flattened, the extremity expanded into a flattened disk, as in the upper; both mandibles covered with soft skin, which, for half their length, is rough, with roundish plates, having their anterior margin somewhat prominent. Nostrils basal, oblong-linear, of moderate size. Head of moderate size, flattened above; neck long and slender, body compact, ovate; legs long and rather stout; tibia bare in its lower half, and reticulate; tarsus rather long, stout, roundish, covered all round with subhexagonal scales; toes rather long, moderately stout, scutellate, at the base reticulate; first more slender, articulated at the same level, second considerably shorter than third. Claws moderate, arched, compressed, laterally grooved, rather obtuse. Head, gular sac, and a small part of neck, destitute of feathers. Wings long and very broad, the second quill longest. Tail short, even, of twelve rather broad feathers. Tongue extremely small, broader than long; gular sac dilatable; œsophagus wide, with a dilatation at the lower part of the neck; proventriculus bulbiform; stomach a powerful gizzard, roundish, with large muscular fasciculi not disposed into distinct muscles, the epithelium very thick, longitudinally fissured; intestine very long, of moderate width; cœca two slight knobs.

ROSEATE SPOONBILL.

PLATALEA AJAJA, *Linn.*

PLATE CCCLXII.—ADULT MALE.

This beautiful and singular bird, although a constant resident in the southern extremities of the peninsula of Florida, seldom extends its journeys in an eastern direction beyond the State of North Carolina. Indeed it is of extremely rare occurrence there, and even in South Carolina, my friend JOHN BACHMAN informs me that he has observed only three individuals in the course of twenty years. He once obtained a specimen in full plumage about ten miles north of Charleston. It is rarely seen in the interior of the country at any distance from the waters of the Atlantic, or those of the Gulf of Mexico. A specimen sent to WILSON at Philadelphia from the neighbourhood of the city of Natchez, in the State of Mississippi, appears to have lost itself, as during my stay in that section of the country I never heard of another; nor have I ever met with one of these birds farther up the Mississippi than about thirty miles from its mouths. Although rather abundant on some parts of the coast of Florida, I found it more so along the Bay of Mexico, particularly in Galveston Bay in the Texas, where, as well as on the Florida Keys, it breeds in flocks. The Spoonbills are so sensible of cold, that those which spend the winter on the Keys, near Cape Sable in Florida, rarely leave those parts for the neighbourhood of St. Augustine before the first days of March. But after this you may find them along most of the water courses running parallel to the coast, and distant about half a mile or a mile from it. I saw none on any part of the St. John's river; and from all the answers which I obtained to my various inquiries respecting this bird, I feel confident that it never breeds in the interior of the peninsula, nor is ever seen there in winter.

The Roseate Spoonbill is found for the most part along the marshy and muddy borders of estuaries, the mouths of rivers, ponds, or sea islands, or keys partially overgrown with bushes, and perhaps still more commonly along the shores of those singular salt-water bayous so abundant within a mile or so of the shores, where they can reside and breed in perfect security in the midst of an abundance of food. It is more or less gregarious at all seasons, and it is rare to meet with fewer than half a dozen together, unless

N°73.
Pl. 362
Roseate Spoonbill.
Male
Drawn from Nature by J.J. Audubon FRSFLS.
Lith.d Printed & Col.d by J.T. Bowen, Phila.a

they have been dispersed by a tempest, in which case one of them is now and then found in a situation where you would least expect it. At the approach of the breeding season, these small flocks collect to form great bodies, as is the manner of the Ibises, and resort to their former places of residence, to which they regularly return, like Herons. During the moult, which takes place in Florida late in May, the young of the preceding year conceal themselves among the close branches of the mangroves and other trees growing over narrow inlets, between secluded keys, or on bayous, where they spend the whole day, and whence it is difficult to start them. Toward night they return to their feeding grounds, generally keeping apart from the old birds. In the same country the old birds pass through their spring moult early in March, after which they are truly beautiful, presenting the appearance which I have attempted to represent in the plate before you. The sight of a flock of fifteen or twenty of these full-dressed birds is extremely pleasing to the student of nature, should he conceal himself from their view, for then he may observe their movements and manners to advantage. Now, they all stand with their wings widely extended to receive the sun's rays, or perhaps to court the cooling breeze, or they enjoy either seated on their tarsi. Again, they all stalk about with graceful steps along the margin of the muddy pool, or wade in the shallows in search of food. After awhile they rise simultaneously on wing, and gradually ascend in a spiral manner to a great height, where you see them crossing each other in a thousand ways, like so many Vultures or Ibises. At length, tired of this pastime, or perhaps urged by hunger, they return to their feeding grounds in a zigzag course, and plunge through the air, as if displaying their powers of flight before you. These birds fly with their necks stretched forward to their full length, and their legs and feet extended behind, moving otherwise in the manner of Herons, or with easy flappings, until about to alight, when they sail with expanded wings, passing once or twice over the spot, and then gently coming to the ground, on which they run a few steps. When travelling to a distant place they proceed in regular ranks, but on ordinary occasions they fly in a confused manner. When the sun is shining, and they are wheeling on wing previous to alighting, their roseate tints exhibit a richer glow, which is surpassed only by the brilliancy of the Scarlet Ibis and American Flamingo.

This beautiful bird is usually fond of the company of our different Herons, whose keen sight and vigilance are useful to it in apprising it of danger, and allowing it to take flight in due time. When the Spoonbills are by themselves and feeding, they can easily be approached by those who, like yourself perhaps, are expert at crawling over the mud on hands and knees, through the tall and keen-edged saw-grass. I well recollect my own success

when, after having seen three of these precious birds alight on their feeding grounds, about a quarter of a mile from where I stood, I managed, after something short of half an hour, to get within shot of them. Then, after viewing them for awhile unseen, I touched one of my triggers, and two of them fell upon the surface of the shallow water. The other might, I believe, have been as easily shot, for it stood, as I have seen Wild Turkey cocks do on like occasions, looking with curious intensity, as it were, upon its massacred friends, until, seeing me get up and wade towards them, it hurriedly extended its broad wings, and flew off towards the sea-shore. When wounded in the wing, they make towards deeper water, and, if closely pursued, will swim to some distance, but without ever attempting to dive, and when at last seized, offer no resistance. On the contrary, if their wings are uninjured, though they may otherwise be severely wounded, they rise and fly to a great distance, or drop while on the way. I have considered these birds as tough to kill, and, when on open ground, even without being in company with Herons, as difficult of approach. They are as nocturnal as the Night Heron, and, although they seek for food at times during the middle of the day, their principal feeding time is from near sunset until daylight. To all such feeding grounds as are exposed to the tides, they betake themselves when it is low water, and search for food along the shallow margins until driven off by the returning tide. Few birds are better aware of the hours at which the waters are high or low, and when it is near ebb you see them wending their way to the shore. Whenever a feeding place seems to be productive, the Spoonbills are wont to return to it until they have been much disturbed, and persons aware of this fact may waylay them with success, as at such times one may shoot them while passing over head. To procure their food, the Spoonbills first generally alight near the water, into which they then wade up to the tibia, and immerse their bills in the water or soft mud, sometimes with the head and even the whole neck beneath the surface. They frequently withdraw these parts, however, and look around to ascertain if danger is near. They move their partially opened mandibles laterally to and fro with a considerable degree of elegance, munching the fry, insects, or small shell-fish, which they secure, before swallowing them. When there are many together, one usually acts as sentinel, unless a Heron should be near; and in either case you may despair of approaching them. I have never seen one of these birds feeding in fresh water, although I have been told that this is sometimes the case. To all those keys in the Floridas in which ponds have been dug for the making of salt, they usually repair in the evening for the purpose of feeding; but the shallow inlets in the great salt-marshes of our southern coast are their favourite places of resort.

The Roseate Spoonbills alight on trees with as much facility as Herons; and even walk on their large branches. They usually nestle on the tops of the mangroves, placing their nests at the distance of a few yards from each other. They are formed of sticks of considerable size and are flat, like most of those of the Heron tribe. The eggs are laid about the middle of April, and are usually three. They measure two inches and five-eighths in length, an inch and seven-eighths in their greatest breadth, are slightly granulated, almost equally rounded at both ends, and have a pure white colour. I have never seen the young when recently hatched; but when able to fly they are greyish-white. The bill is then quite smooth, of a yellowish-green colour, as are the legs and feet, as well as the skin on part of the head. Young birds in their second year have the wings and the lower wing-coverts of a pale roseate tint, the bill more richly coloured, and the legs and feet dark brownish-red, or purplish. At this age, they are unadorned with the curling feathers on the breast; but in the third spring the bird is perfect, although it increases in size for several seasons after. I have never seen one of these birds of the bright red colour assigned to them by some authors.

While on one of the islands of Galveston Bay in Texas, I found eight or ten nests of these birds, placed in low cactuses, amid some hundreds of nests belonging to Herons of different species, but was not rendered aware of the fact until I compared the eggs found there with those procured in the Floridas, although I did at the time mention to my friend EDWARD HARRIS, and to my son, that I thought the eggs and nests of which I speak were those of the Roseate Spoonbill and not of the Herons. What rendered the fact doubtful, however, was, that no Spoonbills were to be seen, as they had all betaken themselves to flight on hearing the reports of our guns.

In connection with the procuring of some of these birds, I find a rather curious occurrence recorded in my journal. On the 2nd of May, 1837, my party and I went on shore from the Revenue Cutter "Campbell," on the island of Galveston, for the purpose of obtaining fish and prawns, the latter of which are in that country extremely abundant, and certainly the largest I have ever seen. Our fishing over, we were on the point of returning, when we saw three Spoonbills alight on a sand-bar, and almost immediately proceed to the water in search of food. My son was despatched after them, and having waded through some muddy parts of the inlet on the shore of which we were standing, he succeeded in getting near, and killed the finest of the three. Almost at the same instant, the back fins of a large fish, resembling those of a shark, were seen meandering above the surface of the shallow waters. My son received prompt intelligence of this, to enable him to make good his return. The monster moved about rather slowly, and JOHN having rammed home a couple of bullets, lodged them in its body, on

which it floundered about apparently in great agony. One of our boats immediately pushed toward the spot, and my son was taken on board, while the animal used its best efforts to get into deeper water. Now sailors and all joined in the chase. The gun was again charged with balls, my son waded once more towards it, and lodged the missiles in its body, while from the bow of the boat it received several blows from the oars and gaff-hook. The tars all leaped into the water, and the bleeding fish was at once closely beset. The boatswain at a single lucky stroke cut off its tail, and having afterwards fastened the hook in one of its eyes, we dragged it to the beach. About a hundred Mexican prisoners, Texian soldiers, and officers, were there; but instead of our prize turning out a shark, it proved to be a sawfish, measuring rather more than twelve feet in length. From its body we took out alive ten young ones. It was cut into pieces by the Mexican prisoners, and soon devoured. Five or six of the young were put into rum, and ultimately carried to England.

The feathers of the wings and tail of the Roseate Spoonbill are manufactured into fans by the Indians and Negroes of Florida; and at St. Augustine these ornaments form in some degree a regular article of trade. Their flesh is oily and poor eating.

Roseate Spoonbill, *Platalea Ajaja*, Wils. Amer. Orn., vol. vii. p. 123.
Platalea Ajaja, Bonap. Syn., p. 346.
Roseate Spoonbill, Nutt. Man., vol. ii. p. 79.
Roseate Spoonbill, *Platalea Ajaja*, Aud. Orn. Biog., vol. iv. p. 188.

Male, 30¾, 53. Female, 28, 48.

Constant resident in the Texas, South Florida, and as far eastward as North Carolina, where it is, however, very rare. Occasionally in summer up the Mississippi to Natchez. Breeds in flocks on trees, low bushes, or cactuses.

Adult Male.

Bill very long, excessively depressed, being when viewed laterally very slender, but when seen from above nearly as broad as the head at the base, considerably contracted in the middle, and at the end expanded into a large obovate disk much broader than the head. Upper mandible with the dorsal outline almost straight, descending at the base, at the tip decurved, the ridge extremely broad and flat, gradually widening beyond the nostrils, at the end terminated by the very small, decurved, blunt claw; the sides declinate at the base, horizontally flattened towards the end, separated in their whole length from the ridge by a narrow groove, their margins soft and blunt. Nostrils basal, oblong-linear, of moderate size. Lower mandible with the

angle very long, narrow, rounded, the crura narrow, and gradually flattened, the extremity expanded into a flattened disk as in the upper. The mandibles are covered with soft skin, which for half their length is rough with roundish plates having their anterior margin somewhat prominent.

Head of moderate size, flattened above. Neck long and slender. Body compact, ovate. Legs long and rather slender; tibia bare in its lower half, and reticulate; tarsus rather long, stout, roundish, covered all round with reticulated subhexagonal scales; toes rather long, moderately stout, covered above with numerous scutella, but at the base reticulated; first more slender, articulated on the same plane; second considerably shorter than third, which is in the same proportion exceeded by the fourth. Claws moderate, arched, compressed, laterally grooved, rather obtuse.

The head, gular sac, and a small part of the neck, destitute of feathers. Those on the neck linear or lanceolate, small, with disunited barbs; a tuft on the lower and fore part of the neck recurved and silky. The feathers on the other parts are of moderate length, ovate, rather compact above, blended beneath. Wings long and very broad; primaries firm, broad, tapering, but rounded, the second longest, the third next, the first a quarter of an inch shorter; secondaries broad and broadly rounded. Tail short, even, of twelve rather broad, abruptly rounded feathers.

Bill yellowish-grey at the base, mottled with brownish-black, in the rest of its extent pale greenish-blue, light on the margins; base of margin of lower mandible greenish-yellow. Iris bright carmine. Feet pale lake; claws brownish-black. Head yellowish-green; space around the eye and the gular sac orpiment orange; a band of black from the lower mandible to the occiput. Feathers of the neck white. Back and wings of a beautiful delicate rose colour; the lower parts of a deeper tint; the tuft of recurved feathers on the fore-neck, a broad band across the wing along the cubitus, and the upper and lower tail-coverts, of a rich and pure carmine with silky lustre. The shafts of all the quills and scapulars are light carmine. On each side of the lower part of the neck and fore part of the body a patch of pale ochre. Tail feathers ochre-yellow, but at the base pale roseate, with the shafts carmine.

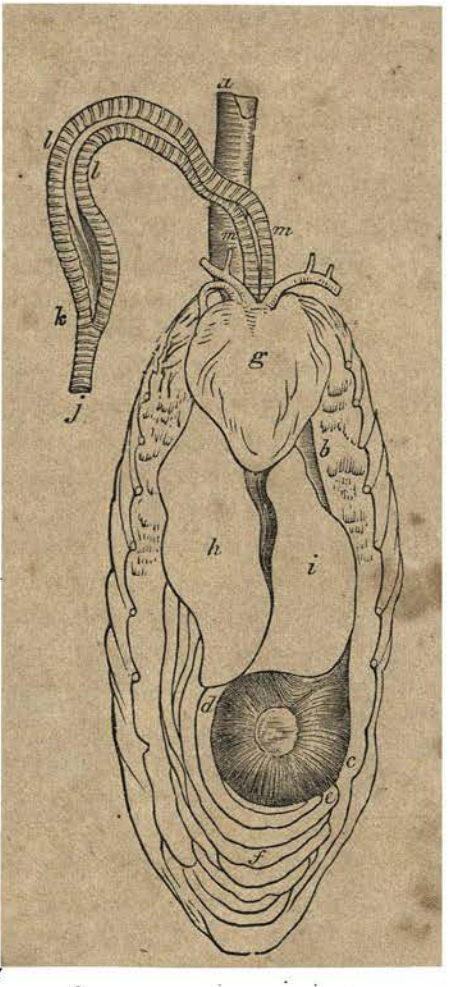
Length to end of tail 30¾ inches, to end of wings 29¾, to end of claws 36; extent of wings 53; bill 7; breadth of gape 1⅝, depth of pouch 2; breadth of bill at the base 1⅛; at the end 2 1/12; bare part of the tibia 3; tarsus 4; hind toe and claw 1 10/12; second toe and claw 2 8/12; middle toe and claw 3 7/12; outer toe and claw 3 1/12; wing from flexure 15¼; tail 4⅔. Weight 4 lbs. 2 oz.

The female is smaller, but resembles the male.

Length to end of tail 28 inches, to end of wings 28, to end of claws 35¾; extent of wings 48. Weight 3 lbs.

The affinities of this remarkable bird being variously represented by authors, it becomes a matter of considerable interest to determine its relations according to its internal organs. The skin is thin, but tough, and the subcutaneous cellular tissue is largely developed. In these respects its affinity is to the Ibises and Curlews, as much at least as to any other birds. On the roof of the mouth are two rows of blunt papillæ, as in many Scolopacidæ. The tongue is extremely small, being only 3 twelfths of an inch in length, but 7 twelfths in breadth at the base, where it is emarginate and furnished with numerous delicate papillæ, the outer much larger. The gular membrane is very dilatable and of the same general nature as that of Cormorants and Pelicans, having a longitudinal series of muscular fibres along the centre, with two layers of fasciculi interposed between the external skin and the internal, the inner fasciculi running parallel to the lower mandible, the outer transversely. The bill is similar to that of the Pelican's modified, the middle part or ridge being flattened, and the unguis abbreviated. The breadth of the mouth is within $1\frac{1}{12}$ inches. The external aperture of the ear is roundish, 4 twelfths in diameter, that of the meatus oblique, oblong, 3 twelfths across. The œsophagus, *a b*, is 17 inches long (including the proventriculus, as in all the other measurements); its diameter at the top $1\frac{1}{4}$ inches, at the distance of 6 inches it contracts to 5 twelfths, then for four inches enlarges, having its greatest diameter $1\frac{1}{12}$ inches; between the coracoid bones it again contracts to half an inch, and on entering the thorax enlarges to an inch. The proventriculus is bulbiform, $1\frac{1}{2}$ inches long, its glandules very large, cylindrical, the longest being $\frac{1}{4}$ inch, and 1 twelfth in diameter. The stomach, *c d*, is a powerful gizzard of a roundish form, 1 inch 11 twelfths long, and 1 inch 10 twelfths broad; the muscular fibres disposed in large fasciculi all around, but not forming distinct lateral muscles; the central tendons very large, being 10 twelfths in diameter; the cuticular lining excessively thick, of a rather soft texture, divided by deep longitudinal irregular fissures, its greatest thickness being about half an inch. The intestine, *d e f*, is very long, measuring 8 feet $9\frac{1}{2}$ inches, of moderate diameter, varying from 4 to $3\frac{1}{2}$ twelfths; it is compactly and beautifully arranged in very numerous somewhat concentric folds, being coiled up like a rope; the duodenum, *d e*, curving backwards and upwards over the stomach for five inches, then returning, and enclosing the pancreas, until under the right lobe of the liver where it receives the biliary ducts. The cloaca is globular, 2 inches in diameter when distended; the rectum, exclusive of the cloaca, $3\frac{1}{2}$ inches, and having at its upper extremity two bulging knobs in place of cœca. Now, the œsophagus and proventriculus are those of a Numenius, the stomach that of a Heron in the arrangement of its fasciculi, and in the softness of its epithelium; but otherwise it differs in being much larger and

more muscular. The intestines are thicker and more muscular than those of Herons, and differ more especially in having two cœcal appendages, which however are extremely short, whereas the Herons have merely a single cœcal prominence.



The heart, *g*, is remarkably large, being 1 inch and 10 twelfths long, 1 inch and a half in breadth. The lobes of the liver, *h i*, are very large, and about *equal*, their greatest length being 3 inches; the gall-bladder globular, 8 twelfths in diameter. One of the testes is 11 twelfths long, 9 twelfths broad; the other 10 twelfths by 7 twelfths; their great size being accounted for by the individual's having been killed in the breeding season.

In a female of much smaller size the œsophagus is 15 inches long; the stomach 2 inches in length, 1 inch and 9 twelfths broad; the intestine 7 feet 7 inches. The contents of the stomach, fishes, shrimps, and fragments of shells.

One of the most remarkable deviations from ordinary forms in this bird is *the division of the trachea previous to its entering the thorax*. It may be described as very short, a little flattened, and quite membranous, the rings being cartilaginous and very thin. Its diameter at the top is 5 twelfths, and it is scarcely less at the lower part, where half-way down the neck, is formed an inferior larynx, *k*, which is scarcely enlarged. The two bronchi, *l m*, *l m*, are in consequence excessively elongated. They are compressed, 5 twelfths in diameter at the commencement, gradually contracting to 3 twelfths, and enlarging a little towards the end; and are singular in this respect that the rings of the upper fourth are incomplete, the tube being completed by membrane in the usual manner, whereas in the rest of their extent, the rings are elliptical, entire, stronger, and those at the lower part united or anchylosed on the inner side. The rings of the trachea are 105, of the two bronchi 73 and 71. The contractor muscles are feeble

and terminate at the lower larynx; from which no muscle extends along the bronchi, which, until they enter the thorax, run parallel and in contact, being enclosed within a common sheath of dense cellular tissue. The bronchi have the last ring much enlarged, and open into a funnel, which passing backwards and terminating in one of the abdominal cells, is perforated above with eight or ten transverse elliptical slits, which open into similar tubes or tunnels, opening in the same manner into smaller tubes, and thus ramifying through the lungs.

In the male bird, of which the upper part of the trachea has been destroyed, there are in one bronchus 80, in the other 71 rings, 20 of the upper rings being incomplete.

The vertebræ of the neck have no resemblance to those of Herons, nor does that part curve in the same abrupt manner; and the sternum is in all essential respects similar to that of Curlews, Tringas, and other birds of that family, it having a very prominent crest, with two deep posterior notches on each side. In fact, the sternum of Tringa Cinclus is almost an exact miniature of it.

The compact form of the body, its great muscularity, the form of the legs, the length and slenderness of the neck, the form and bareness of the head, and the elongation of the bill, especially when it is laterally viewed, all indicate an affinity to the Tantali and Numenii. But the Spoonbills are also allied in various degrees to Herons and Pelicaninæ; so that they clearly present one of those remarkable centres of radiation, demonstrative of the absurdity of quinary and circular arrangements, founded merely on a comparison of skins.

FAMILY XXXVIII.—ARDEINÆ. HERONS.

Bill longer than the head, stout, tapering, compressed, pointed, its edges often irregularly serrate. Head oblong, compressed; neck very long; body much compressed. Eyes large or moderate. Nostrils basal, linear, longitudinal. Legs long, rather slender; tibia bare to a great extent; tarsus compressed, anteriorly scutellate; toes rather long, the first on the same place, of moderate size, the outer toe a little longer than the inner, and with a slight web at the base; all compressed and scutellate. Claws rather long, arched, compressed, acute, that of the hind toe larger and more curved. Plumage blended. Wings long, very broad, with the outer four quills longest, secondaries very long. Tail very short, nearly even, of twelve rather weak feathers. Œsophagus very wide, without dilatation; stomach small, very thin, with the inner coat soft and smooth; intestine very long and extremely narrow; no cœcal appendages, but the large intestine forming a small sac at its commencement; cloaca very large, globular. Trachea simple, generally cylindrical, with the bronchi wide, and a single pair of slender inferior laryngeal muscles. Nests large, flat, widely constructed, placed on trees, bushes, sometimes on the ground; eggs from three to four, oval, light blue. Young remain in the nest until fledged.

Genus I.—ARDEA, *Linn.* HERON.

Night Herons. Bill slightly longer than the head, stout, tapering, compressed, with the upper outline somewhat curved; legs of moderate length, bare part of tibia short; neck thick; body full; features of the neck elongated and curved backwards.

BLACK-CROWNED NIGHT HERON, QUA-BIRD.

ARDEA NYCTICORAX, *Linn.*

PLATE CCCLXIII.—ADULT MALE AND YOUNG.

The Night Heron is a constant resident in the Southern States, where it is found in abundance in the low swampy tracts near the coast, from the mouth of the Sabine river to the eastern boundaries of South Carolina. On the whole of that vast extent of country, it may be procured at all seasons. The adult birds keep farther south than the young, flocks of the latter remaining in South Carolina during the whole winter, and there the Night Herons are at that period more common than most other species of the family. In that State it is named "the Indian Pullet," in Lower Louisiana the Creoles call it "*Gros-bec*," the inhabitants of East Florida know it under the name of "Indian Hen," and in our Eastern States its usual appellation is "Qua-bird."

In the course of my winter rambles through East Florida, I met with several of the large places of resort of Night Herons, and, in particular, one remarkable for the vast number of birds congregated there. It is about six miles below the plantation of my friend JOHN BULOW, Esq., on a bayou which opens into the Halifax river. There several hundred pairs appeared to be already mated, although it was only the month of January; many of the nests of former years were still standing, and all appeared to live in peace and contentment. My friend JOHN BACHMAN is acquainted with a place on Ashley river, about four miles distant from Charleston, where, among the branches of a cluster of live-oak trees, he has for the last fifteen years found a flock of about fifty of these birds during the winter. They were all young, not a single individual having been observed in the adult plumage, which is the more remarkable, because it is usual for young birds to retreat farther south during winter than the old. It is very common at this period for the sportsmen near Charleston to take their stand along the margins of the salt-water ponds, to which the Herons generally resort about dusk; and they frequently obtain several shots in an evening, but not a single old bird is known to have been killed at this season.

The Night Heron seldom advances very far into the country, but remains on the low swampy lands along the coast. It is rare to see one farther up

No 73
Pl. 363
Black Crowned Night Heron or Qua Bird
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
1 Adult 2 Young
Lith. Printed & Col. by J. T. Bowen Philad.

the Mississippi than the mouth of the Arkansas, to which a few are at times induced to go while rambling along the great stream. I never saw one, nor heard of any, whilst in Kentucky, and I doubt much if they are ever seen in the upper parts of the State of Tennessee. The distance of a hundred miles from the tide-mark appears to be the farthest extent of their inland movements. On the other hand, they are fond of resorting to the islands along the coast, on many of which they breed.

At the approach of spring, great numbers of those who have wintered far south, leave their places of sojourn and migrate eastward, although probably an equal number remain in the low lands of Louisiana and the Floridas during the whole year. There, indeed, I have found them with eggs in April and May, and as young birds just fledged were very abundant at the same places, I concluded that these eggs were of the second laying. By the middle of March, the number of Night Herons is seen to increase daily in the Carolinas, and, about a month later, some make their appearance in the Middle Districts, where many remain and breed. They are not abundant in the State of New York, are seen sparingly breeding in Massachusetts, while only a few proceed to Maine, and farther eastward they are looked upon as a great curiosity. In Nova Scotia, Newfoundland, and Labrador, this species is quite unknown.

Some European writers have alleged, that the Night Heron is scarce in the United States, and of rare occurrence even in the southern parts. I wish these people had been with me and my friend BACHMAN, or with some of the many hundred persons who reside in the Southern Districts, or have travelled from Louisiana to North Carolina. How strange it would have appeared to such assertors of notions, to have seen a boat-load of Night Herons shot in the course of a few hours, and that too in the winter season.

Excepting while breeding, this species is extremely shy and wary, especially the adults. To approach them from a distance after they have seen you, is no easy task. They seem to know the distance at which your gun can injure them, they watch all your movements, and at the proper moment leave their perches. Should you chance to crack a stick while advancing towards them, they start at once, give a few raps with their wings, in the manner of the Common Pigeon, and fly off as if delighted at your disappointment. On the contrary, you may shoot them with ease, if you lie in wait near the places to which they resort to roost by day, and at which they generally arrive singly, or a few at a time, when, from your place of concealment among the trees, you may kill them the moment they alight over your head, and at a short distance. In this manner I have known forty or fifty procured by two sportsmen in the course of about two hours. You may also not unfrequently shoot them at any hour of the day, by starting

them from secluded feeding-grounds, and thus I have shot a good many in different parts of the United States, and even in the Middle Districts. They are, however, rarely shot whilst on the ground, their hearing being still more acute than that of the American Bittern, which prefers squatting in the grass to flying off, when any noise is heard, whereas the Night Heron rises immediately.

This species breeds in communities around the stagnant ponds, either near rice plantations or in the interior of retired and secluded swamps, as well as on some of the sea-islands covered with evergreen trees. Their heronries are formed either in low bushes, or in middle-sized or tall trees, as seems most convenient or secure. In the Floridas, they are partial to the mangroves that overhang the salt-water; in Louisiana, they prefer the cypresses; and in the Middle States, they find the cedars most suitable. In some breeding-places within a few miles of Charleston, which I visited in company with my friend JOHN BACHMAN, the nests were placed on low bushes, and crowded together, some within a yard of the ground, others raised seven or eight feet above it, many being placed flat on the branches, while others were in the forks. Hundreds of them might be seen at once, as they were built on the side of the bushes fronting the water. Those which I found in the Floridas were all placed on the south-west sides of mangrove islands, but were farther apart from each other, some being only about a foot above high-water mark, while others were in the very tops of the trees, which, however, scarcely exceeded twenty feet in height. In some inland swamps in Louisiana, I saw them placed on the tops of tall cypress trees about a hundred feet high, and along with those of *Ardea Herodias*, *A. alba*, and some Anhingas. In the Jerseys I have found the Night Herons breeding on water-oaks and cedars; and my friend THOMAS NUTTALL informs me, that "in a very secluded and marshy island, in Fresh Pond, near Boston, there likewise exists one of these ancient heronries; and though the birds have been frequently robbed of their eggs, in great numbers, by mischievous boys, they still lay again immediately after, and usually succeed in raising a second brood." The same accurate observer remarks, that "about the middle of October, the Qua-birds begin to retire from this part of Massachusetts, towards their southern winter quarters, although a few of the young birds still linger occasionally to the 29th or 30th of that month." This last observation is a further evidence of the reluctance which the young of this species feel to go as far south during winter as the old birds.

The nest of the Night Heron is large, flattish, and formed of sticks placed in different directions, sometimes to the height of three or four inches. At times it is arranged with so little care, that the young upset it before they

are able to fly. Many of the nests are annually repaired, and these birds, when they have once found an agreeable settlement, return regularly to it, until some calamity forces them to abandon it. The full number of the eggs is four, and they measure at an average two inches and one-sixteenth by an inch and a half. They are thin-shelled, and of a plain light sea-green colour. In about three weeks after the young are hatched, most of them leave the nest, and crawl about the branches, to which they cling firmly, ascending to the tops of the bushes or trees, and there awaiting the return of their parents with food. If you approach them at such times, the greatest consternation ensues both among the young and the old birds; the loud and incessant croaking which both have until then kept up, suddenly ceases; the parent birds rise in the air, sail around and above you, some alighting on the neighbouring trees; while the young scramble off in all directions to avoid being taken. So great at times is their terror, that they throw themselves into the water, and swim off with considerable rapidity, until they reach the shore, when they run and hide in every convenient place. Retire for half an hour, and you will be sure to hear the old and the young calling to each other; the noise gradually increases, and in a short time is as loud as ever. The stench emitted by the excrements with which the abandoned nests, the branches and leaves of the trees and bushes, and the ground, are covered, the dead young, the rotten and broken eggs, together with putrid fish and other matters, renders a visit to these places far from pleasant. Crows, Hawks, and Vultures torment the birds by day, while Racoons and other animals destroy them by night. The young are quite as good for eating as those of the Common Pigeon, being tender, juicy, and fat, with very little of the fishy taste of many birds which, like them, feed on fishes and reptiles. At this period few if any of the old birds have the long feathers of the hind head, and these are not reproduced before the latter part of the following winter, when they seem to attain their extreme length in a few weeks.

The flight of the Night Heron is steady, rather slow, and often greatly protracted. They propel themselves by regular flappings of the wings, and, like the true Herons, draw in their head on the shoulders, while their legs stretch out behind, and with the tail form a kind of rudder. When alarmed they at times rise high in the air, and sail about for awhile. They sail in the same manner before alighting on their feeding grounds, which they rarely do without having previously attended to their security by alighting on the neighbouring trees and looking about them. Their migrations are performed under night, when their passage is indicated by their loud hoarse notes, resembling the syllable *qua*, uttered at pretty regular intervals. On these occasions they appear to fly faster than usual.

On the ground, this bird exhibits none of the grace observed in all the

true Herons; it walks in a stooping posture, the neck much retracted, until it sees its prey, when, with a sudden movement, it stretches it out and secures its food. It is never seen standing motionless, waiting for its prey, like the true Herons, but is constantly moving about in search of it. Its feeding places are the sides of ditches, meadows, the shady banks of creeks, bayous, and ponds or rivers, as well as the extensive salt-marshes and mud-bars left exposed at low water; and I have observed it to alight in the ponds in the suburbs of Charleston towards evening, and feed there. In all such situations, excepting the last, this bird may often be seen by day, but more especially in the evening or morning twilight, wading up to its ankles, or, as we commonly say, its knee-joints. Its food consists of fishes, shrimps, tadpoles, frogs, water-lizards, and leeches, small crustacea of all kinds, water insects, moths, and even mice, which seem not less welcome to it than its more ordinary articles of food. When satisfied, it retires to some high tree on the banks of a stream or in the interior of a swamp, and there it stands, usually on one leg, for hours at a time, apparently dozing, though seldom sound asleep.

When wounded, this bird first tries to make its escape by hiding among the grass or bushes, squatting the moment it finds what it deems a secure place; but if no chance of a safe retreat occurs, it raises its crest, ruffles its feathers, and, opening its bill, prepares to defend itself. It can bite pretty severely, but the injury inflicted by its bill is not to be compared with that produced by its claws, which on such occasions it uses with much effect. If you seize it, it utters a loud, rough, continued sound, and tries to make its escape whenever it perceives the least chance.

The Night Heron undergoes three annual changes of plumage ere it attains its perfect state, although many individuals breed in the spring of the third year. After the first autumnal moult, the young is as you see it represented in the plate. In the second autumn, the markings of the neck and other parts have almost entirely disappeared; the upper parts of the head have become of a dull blackish-green, mixing near the upper mandible with the dull brown of the first season, while the rest of the plumage has assumed a uniform dull ochreous greyish-brown. In the course of the following season, the bird exhibits the green of the shoulders and back, the head is equally richly coloured, and the frontal band between the upper mandible and the eye, and over the latter, is pure white. At this age it rarely has the slender white feathers of the hind head longer than an inch or two. The sides of the neck, and all the lower parts, have become of a purer greyish-white. The wings are now spotless in all their parts, and of a light brownish-grey, as is the tail. The following spring, the plumage is complete, and the bird is as represented in the plate. After this period,

with the exception of losing its long crest-feathers after the young are hatched, it retains its colouring. No difference can be observed in the tints of the sexes, but the male is somewhat larger.

A very considerable difference in size is observable at all seasons in birds of this species. Some that are fully feathered, and therefore at least three years old, measure as much as four inches less than others of the same sex, and weigh less in proportion. These circumstances might suffice with some naturalists to attempt to form two species out of one, but in this they would certainly fail.

In the neighbourhood of New Orleans, and along the Mississippi as far up as Natchez, the shooting of this species is a favourite occupation with the planters, who represent it as equalling any other bird in the delicacy of its flesh.

The frog, of which I have introduced a figure, is common in the retired swamps which the Night Heron frequents, and is often devoured by it. The flowering plants which you see, are abundant in the States of Georgia and South Carolina, as well as in the Floridas.

Night Heron or Qua-bird, *Ardea Nycticorax*, Wils. Amer. Orn., vol. vii. p. 3.
Ardea Nycticorax, Bonap. Syn., p. 306.
Qua-bird or American Night Heron, *Ardea discors*, Nutt. Man., vol. ii. p. 54.
Night Heron, *Ardea Nycticorax*, Aud. Orn. Biog., vol. iii. p. 275; vol. v. p. 600.

Male, 25 7/12, 44.

Resident in the Floridas and Texas, where it breeds. Migrates in spring eastward as far as Maine, up the Mississippi to Memphis. Occurs one hundred miles inland. Rather common. Returns southward early in autumn.

Adult Male in Spring.

Bill a little longer than the head, strong, straight, compressed, tapering. Upper mandible with the dorsal line slightly arched and declinate, the ridge broad and rather rounded at the base, narrowed towards the end, the sides sloping, the edges very sharp and inflected, obscurely serrated with minute oblique slits, and having a distinct notch close to the compressed, rather obtuse tip. Nasal groove wide at the base, extending narrow to near the tip; nostrils basal, linear, wider behind, longitudinal. Lower mandible with the angle very long and narrow, the dorsal line straight and sloping upwards, the sides flat, the sharp obscurely jagged edges slightly inflected, the tip very acute.

Head oblong, much compressed; eyes large. Neck long. Body rather slender, compressed. Feet rather long, robust; tibia bare at its lower part;

tarsus covered anteriorly along its upper two-thirds with scutella, below and on the sides with large angular scales; toes long and rather slender, scutellate above, flat beneath, marginate; hind toe stout, fourth a little longer than second, third much longer; claws of moderate size, stout, arched, compressed, rather acute, that of middle toe beautifully pectinate on the inner edge.

Plumage soft, blended. Feathers of the upper and hind part of the head elongated and loose, with three very long, linear incurved occipital feathers, having their webs inflected. The feathers of the neck, especially of its lower part and sides, are also elongated, the latter curved backwards. Wings of moderate length, broad, rounded; primaries broad, rounded, the third longest, the first longer than the fourth. Tail short, slightly rounded, of twelve broad, rounded feathers.

Bill black. Bare loral space and eyelids yellowish-green; iris bright red. Feet yellow; claws brown. Feathers on the upper part of the head, the fore part of the back, and the scapulars, glossy blackish-green; anterior part of forehead white; neck anteriorly white, on the sides and behind shaded into pale lilac, the lower elongated feathers tinged with cream-colour; breast and abdomen white, similarly tinged. Wings, rump, and tail, light greyish-blue, tinged with lilac.

Length to end of tail 25$\frac{7}{12}$ inches, to end of wings 25$\frac{1}{12}$, to end of claws 30$\frac{4}{12}$; extent of wings 44; wing from flexure 13$\frac{3}{4}$; tail 5; bill along the ridge 3$\frac{3}{12}$, along the edge of lower mandible 4$\frac{3}{12}$; bare part of tibia 1$\frac{1}{4}$; tarsus 3$\frac{1}{4}$; middle toe 3; its claw $\frac{7}{12}$. Weight 1 lb. 14 oz.

Young after first moult.

Bill and bare space about the eye yellowish-green, the ridge of the upper mandible, and part of the lower towards the end, black. Iris bright red. Feet pale greyish-yellow. At this period the occipital feathers are not developed. The general colour of the upper parts is light greyish-brown, the edges of the feathers paler; that of the lower parts dull white, tinged with grey and cream colour, with the central part of each feather greyish-brown; the feathers of the back and wings, as well as the secondary quills, have a long triangular spot of brownish-white at the end; the rump and tail more tinged with bluish-grey.

The Adult Female resembles the Male.

Amaryllis Atamasco, *Willd.* Sp. Pl., vol. ii. p. 51. *Pursh*, Flora Amer. Sept., vol. i. p. 222.

This species, which grows in swamps, and moist woods, in Virginia and

Yellow Crowned Night Heron

1 Adult Male Spring Plumage 2 Young in October

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith^d Printed & Col^d by J. T. Bowen Philad^a

Carolina, is characterized by having an acute bifid spatha, an erect funnel-shaped corolla of a pale rose-colour or pure white, with a short tube at the base, the segments nearly equal, as are the declinate stamens. It flowers in June and July, and attains a height of from eight inches to a foot.

YELLOW-CROWNED NIGHT HERON.

ARDEA VIOLACEA, *Linn.*

PLATE CCCLXIV.—ADULT AND YOUNG.

The Yellow-crowned Heron, which is one of the handsomest species of its tribe, is called "Cap-cap" by the Creoles of Lower Louisiana, in which country it is watched and shot with great eagerness, on account of the excellence of its flesh. It arrives about New Orleans toward the end of March, and departs in the middle of October. On arriving, they throw themselves among the thickets along the bayous, where they breed. Like the Night Heron, this species may be enticed near by imitating its cries, when it approaches, cutting many curious zigzags in the air, and alights close by. It is a curious circumstance that when passing over several gunners placed on the watch for them, they dive toward the ground if shot at and missed, and this they do several times in succession, according to the number of shots. It is in the evening and at dawn that they are chiefly obtained. They are said not to travel in boisterous weather, or when there is thunder; and I have heard the same stated with regard to the Night Heron.

In some parts of the Southern States, this species is quite abundant, while in the intermediate tracts it is seldom or never met with. Thus, in the Floridas, I found great numbers on a bayou near Halifax river, but afterwards saw none until I reached one of the keys, more than two hundred miles distant, and farther south, where it was breeding in society. The first of these flocks I saw in winter, the other on the 22nd of May. Again, while proceeding toward the Texas, we saw a few on an island in Bay Blanche, but met with none afterwards until we reached Galveston Island, where they were plentiful. They seldom advance eastward far beyond

North Carolina, and I am not aware of any having been seen farther than New Jersey. On the other hand they are not generally found on the Mississippi beyond Natchez, although stragglers may sometimes be seen farther up.

This species is by no means entirely nocturnal, for I have seen it searching for food among the roots of mangroves at all hours of the day, and that as assiduously as any diurnal bird, following the margins of rivers, and seizing on both aquatic and terrestrial animals. Whilst at Galveston, I frequently saw a large flock similarly occupied. When they had satisfied their hunger, they would quietly remove to some safe distance toward the middle of an island, where, standing in a crouching posture on the ground, they presented a very singular appearance. That they are able to see to a considerable distance on fine clear nights, I have no doubt, as I am confident that their migratory movements are usually performed at such times, having seen them, as well as several other species, come down from a considerable height in the air, after sun-rise, for the purpose of resting and procuring food.

The flight of the Yellow-crowned Heron is rather slow, and less protracted than that of the Night Heron, which it however somewhat resembles. When in numbers, and surprised on their perches, they usually rise almost perpendicularly for thirty or forty yards, and then take a particular direction, leading them to some well-known place. Whenever I have started them from the nest, especially on the Florida Keys, they would sneak off on wing quite low, under cover of the mangroves, and fly in this manner until they had performed the circuit of the island, when they would alight close to me, as if to see whether I had taken their eggs or young.

When on the ground, they exhibit little of the elegance displayed by the Louisiana, the Reddish, the Blue, or the White Herons; they advance with a less sedate pace, and seldom extend their neck much even when about to seize their food, which they appear to do with little concern, picking it up from the ground in the manner of a domestic fowl. Nor are they at all delicate in the choice of their viands, but swallow snails, fish, small snakes, crabs, crays, lizards, and leeches, as well as small quadrupeds, and young birds that have fallen from their nests. One which was killed by my friend EDWARD HARRIS, Esq., on the 19th of April, 1837, on an island in the Bay of Terre Blanche, about 4 o'clock in the evening, was, when opened next morning, found to have swallowed a terrapin, measuring about an inch and a half in length, by one in breadth. It was still alive, and greatly surprised my companions as well as myself by crawling about when liberated.

This species places its nest either high or low, according to the nature of

the place selected for it, and the abundance of food in the neighbourhood. In the interior of swampy woods, in Lower Louisiana, I have found the nests placed on the tops of the loftiest cypresses, and on low bushes, but seldom so close together as those of many other Herons. On the Florida Keys, where I have examined more of these tenements than in any other part, I found them either on the tops of mangroves, which there seldom attain a greater height than twenty-five feet, or on their lowest branches, and not more than two or three feet from the water. In the Carolinas, they usually resort to swamps, nestling on the bushes along their margins. The nest is similar to that of other Herons, being formed of dry sticks loosely put together, and a few weeds, with at times a scanty lining of fibrous roots. The eggs are generally three, never, in as far as I have seen, more, of a pale blue colour, inclining to green, thin-shelled, and averaging two inches in length by an inch and three and a half eighths in their greatest breadth. The young seldom remain in the nest until able to fly, as is the case with those of some other species, but usually leave it to follow their parents along the shores. If scared from the nest, they scramble along the branches with considerable agility, and hide whenever an opportunity occurs. I have given the figure of a young bird procured in October.

The differences between the periods at which this bird breeds in different latitudes, correspond with those observed with respect to other species of the same tribe. Thus, eggs and young may be procured on the Florida Keys six weeks sooner than in South Carolina, although two broods are usually raised in both districts, the birds frequently removing from one place to another for the purpose. The beautiful slender plumes on the head and back generally fall off soon after incubation commences, although I have on a few occasions found the male still bearing these ornaments when the female was sitting on her second set of eggs. When the young are just able to fly I have found them good eating, but the old birds I never relished.

When wounded, the Yellow-crowned Heron defends itself vigorously with its claws, the scratches inflicted by which are severe, and also strikes with the bill. If not brought to the ground, in a place where the trees are close and thickly branched, it is difficult to obtain them without a second shot, for they scamper quickly from one twig to another, and are very soon out of reach.

Wilson complains that the name "Yellow-crowned" should be given to this species, and this would almost induce me to suppose that he had never seen one in the breeding season, when the white of the head is strongly tinged with yellow, which however disappears at the approach of autumn, when the bird might with all propriety be named the White-crowned Heron.

The adult bird represented in the plate was shot by my friend Dr. BACHMAN, a few miles from Charleston, while I was in his company; and the drawing of the plant was made by his amiable sister-in-law, Miss MARTIN.

YELLOW-CROWNED HERON, *Ardea violacea*, Wils. Amer. Orn., vol. viii. p. 26.
ARDEA VIOLACEA, Bonap. Syn., p. 306.
WHITE-CROWNED HERON, Nutt. Man., vol. ii. p. 52.
YELLOW-CROWNED HERON, *Ardea violacea*, Aud. Orn. Biog., vol. iv. p. 290.

Adult, 23½, 43½. Young in October, 23½, 40.

A few spend the winter in Florida. Migrates in spring as far as New Jersey, up the Mississippi to Natchez. Never goes far inland. Not very abundant. Migratory.

Adult Male in spring plumage.

Bill a little longer than the head, strong, straight, moderately compressed, tapering. Upper mandible with the dorsal line slightly arched and declinate, the ridge broad, convex, the sides bulging, the edges sharp and overlapping, the tip slender, with a distinct notch. Nasal depression wide, with a broad shallow groove extending towards the end of the mandible; nostrils basal, oblong, pervious. Lower mandible with the angle very long and narrow, the dorsal line straight and sloping upwards, the sides sloping outwards and flat, the edges sharp, obscurely serrulate, the tip slender.

Head large, oblong, compressed. Eyes large. Neck long. Body slender, much compressed. Feet long, moderately stout; tibia bare at its lower part, with reticular angular scales; tarsus covered anteriorly for more than half its length with scutella, over the rest of its extent with angular scales; toes long and rather slender, with numerous scutella above, flat beneath, marginate; hind toe stout, fourth a little longer than second, third much longer. Claws of moderate size, arched, compressed, acute, that of middle toe beautifully pectinate on the inner edge.

Plumage loose, soft, and blended; feathers on the upper part of the head lanceolate and acuminate, those on the occiput very long, linear, forming a pendant crest, which, however, is capable of being erected; on the sides of the neck oblong, and directed obliquely backwards; on the fore part of the back ovate-oblong; on the lower part generally very long and loose. Between the scapulæ are two longitudinal series of very elongated feathers, with loose margins, the longest extending far beyond the end of the tail. Wings long, of great breadth, rounded; the primaries broad and rounded, the third longest, the second and fourth nearly equal, the first half an inch shorter than the longest, the rest slowly graduated; secondaries very broad, rounded, the inner elongated, some of them nearly as long as the outer primaries

when the wing is closed. Tail short, even, of twelve broad, rounded feathers.

Bill black. Iris reddish-orange; margins of eyelids and bare space in front of the eye, dull yellowish-green. Tibia, upper part of the tarsus, its hind part, and the soles, bright yellow; the scutella and scales, the fore part of the tarsus, the toes, and the claws, black. Upper part of the head pale reddish-yellow in front, white behind, of which colour are most of the elongated crest feathers, as well as an oblong patch extending from the corner of the mouth, beneath, to behind the ear. The rest of the head, and a small portion of the neck all round, bluish-black; that colour extending nearly half way down the neck behind. The rest of the neck all round, as well as the upper and lower surface of the body, light greyish-blue; the feathers of the fore part of the back, and wings, having their central parts bluish-black, which is also the case with the elongated loose feathers, the dark part margined with bluish-white. Alula, primary coverts, and primary quills, dark bluish-grey; secondaries and tail-feathers of a lighter tint.

Length to end of tail 23½ inches, to end of wings 25, to end of loose feathers 30, to end of claws 30¼, to carpal joint 12¼; extent of wings 43½; bill along the ridge 2⅞, along the edge of lower mandible 4; width of gap 1¼; depth of bill at base 7/8; wing from flexure 12½; bare part of tibia 2¼; tarsus 4⅛; middle toe 2½; its claw ⅝; outer toe 1⅞; its claw ⅝; inner toe 1¾, its claw ⅝; hind toe 1, its claw ⅝; tail 5. Weight 1 lb. 9 oz.

The Female resembles the male, but is somewhat smaller.

The young in October.

Bill greenish-black, the lower and basal part of the lower mandible greenish-yellow, as are the eyelids and bare space before the eye. Iris pale orange. Legs and feet dull yellowish-green, the scutella and scales in front, as well as the claws, dusky. Upper part of head and hind neck, black, longitudinally marked with somewhat triangular elongated white spots; sides of the head and neck pale dull yellowish-brown, streaked with darker; the upper parts light grey, tinged with brown, the feathers edged with yellowish-white, and tipped with a triangular spot of the same; the primaries and their coverts with the tail darker, margined with dull white. The fore part of the neck, and all the lower parts, dull yellowish-grey, each feather with its central part dark greyish-brown; lower tail-coverts unspotted.

Length to end of tail 23½, to end of claws 29½; extent of wings 40. Weight 1lb. 7 oz.

Adult Male from South Carolina.

The upper mandible is slightly concave, with a median prominent ridge; the palate convex, with two ridges; the posterior aperture of the nares linear

with an oblique papillate flap on each side; the lower mandible deeply concave. The tongue is of moderate length, measuring 1⅞ inches, emarginate at the base, trigonal, flat above, tapering to a point. The œsophagus, which is 12 inches long, gradually diminishes in diameter from 1½ inches to 1 inch. The proventriculus is 1½ inches long, its glandules cylindrical, forming a complete belt, the largest 3 twelfths long. The stomach is roundish, 2 inches in diameter, compressed; its muscular coat thin, and composed of large fasciculi; its tendinous spaces nearly 1 inch in diameter; its inner coat even, soft, and destitute of epithelium. There is a small roundish pyloric lobe, 4 twelfths in diameter; the aperture of the pylorus is extremely small, having a diameter of only half a twelfth. The intestine is long and very slender, 6 feet 3 inches in length, its diameter at the upper part 3 twelfths, diminishing to 2¼ twelfths, for about a foot from the extremity enlarged to 5 eighths; the rectum 6¼ inches long; the cœcum 5 twelfths long, 1⅝ twelfths in diameter at the base, tapering to 1 twelfth, the extremity rounded. The stomach contained fragments of crustacea.

The trachea is 8½ inches long, cylindrical; the rings 154, and ossified; its diameter at the top 5¼ twelfths, diminishing in the space of an inch and a half to 3 twelfths, and so continuing nearly to the end, when it contracts to 2¼ twelfths. The last rings are much extended, and divided into two portions, the last transverse half ring arched, and 5 twelfths in length. The bronchi are in consequence very wide at the top, gradually taper, and are composed of about 25 half rings. The contractor muscles are very feeble; the sterno-tracheal slender; a pair of inferior laryngeal muscles inserted into the first bronchial ring.

AMERICAN BITTERN.

ARDEA LENTIGINOSA, *Swains.*

PLATE CCCLXV.—MALE AND FEMALE.

It never was my fortune to have a good opportunity of observing all the habits of this very remarkable bird, which, in many respects, differs from most other Herons. It is a winter resident in the Peninsula of the Floridas, as well as many of the keys or islets which border its shores. But the

American Bittern

1. Male. 2. Female

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T. Bowen Phil.a

greater number of individuals which pass over the United States, on their way northward, in March, come from places beyond our southern limits. During my residence in Kentucky, I never saw nor heard of the occurrence of one of them; and although I have killed and assisted in killing a considerable number at various times of the year, I never heard their booming or love-notes; or, if I have, I did not feel assured that the sounds which reached my ears were those of the American Bittern. This may probably appear strange, considering the many years I have spent in searching our swamps, marshes, and woods. Yet true it is that in all my rambles I had not the good fortune to come upon one of these birds sitting on its eggs, either among the grass or rushes, or on the branches of low bushes, where, I have been informed, it builds.

In Lower Louisiana it is called the "Garde Soleil," because they say it will stand on one foot for hours, with its eyes, or one of them at least, fixed on the orb of day, and frequently spread out its wings, in the manner of Cormorants and Vultures, to enjoy the heat, or perhaps the gentle breeze. There it is seldom obtained in spring, but is a regular autumnal visitant, appearing early in October, and frequenting the marshes both of fresh and salt water, where many remain until the beginning of May. It is then common in the markets of New Orleans, where it is bought by the poorer classes to make gombo soup. In almost every other part of the United States it is commonly called the "Indian Pullet," or "Indian Hen."

Although in a particular place, apparently favourable, some dozens of these birds may be found to-day, yet, perhaps, on visiting it to-morrow, you will not find one remaining; and districts resorted to one season or year, will be found deserted by them the next. That they migrate by night I have always felt assured, but that they are altogether nocturnal is rather uncertain, for in more than half a dozen instances I have surprised them in the act of procuring food in the middle of the day when the sun was shining brightly. That they are extremely timid I well know, for on several occasions, when I have suddenly come upon them, they have stood still from mere terror, until I have knocked them down with an oar or a stick. Yet, when wounded, and their courage is raised, they shew great willingness to defend themselves, and if in the presence of a dog, they never fail to spread out to their full extent the feathers of the neck, leaving its hind part bare, ruffle those of their body, extend their wings, and strike violently at their enemy. When seized they scratch furiously, and endeavour to bite, so that, unless great care be taken, they may inflict severe wounds.

I never saw one of them fly farther than thirty or forty yards at a time; and on such occasions, their movements were so sluggish as to give opportunities of easily shooting them; for they generally rise within a few yards

of you, and fly off very slowly in a direct course. Their cries at such times greatly resemble those of the Night and Yellow-crowned Herons.

My friends Dr. BACHMAN and Mr. NUTTALL, have both heard the love-notes of this bird. The former says, in a letter to me, "their hoarse croakings, as if their throats were filled with water, were heard on every side;" and the latter states that "instead of the *búmp* or *bömp* of the true Bittern, their call is something like the uncouth syllables of *'pump-ău-gàh*, but uttered in the same low, bellowing tone."

Dr. BACHMAN procured, on the 29th of April, 1833, about forty miles from Charleston, individuals in the ovaries of which he found eggs so large as to induce him to believe that they would have been laid in the course of a single week. Some others which were procured by him and myself within nine miles of Charleston, on the 29th of March, had the eggs extremely small.

While at Passamaquoddy Bay, at the eastern extremity of the United States, I was assured that this species bred in the vicinity; but I saw none there, or in any of the numerous places examined on my way to Labrador and Newfoundland. In neither of these countries did I meet with a single person who was acquainted with it.

In few other species of maritime or marsh birds have I seen so much difference of size and weight, even in the same sex. Of about twenty specimens in my possession, scarcely two correspond in the length of the bills, legs, or wings. The plate before you was engraved from a drawing made by my son JOHN WOODHOUSE.

AMERICAN BITTERN, *Ardea Minor*, Wils. Amer. Orn., vol. vii. p. 35.
ARDEA MINOR, Bonap. Syn., p. 307.
AMERICAN BITTERN, *Ardea lentiginosa*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 374.
AMERICAN BITTERN, Nutt. Man., vol. ii. p. 60.
AMERICAN BITTERN, *Ardea minor*, Aud. Orn. Biog., vol. iv. p. 296.

Male, 27, 45. Female, 26½, 42½.

Winter resident in the Floridas. Migrates over most part of the United States. Not seen in Kentucky. Abundant in Texas. Migratory.

Adult Male.

Bill longer than the head, moderately straight, stout, compressed, tapering to the point. Upper mandible with its dorsal line straight, towards the end slightly convex and declinate, the ridge broad and rather rounded at the base, gradually narrowed to the middle, then a little enlarged, and again narrowed to the point, the sides bulging, towards the margin erect, the edges sharp, towards the end obscurely serrated, the tip narrow, with a distinct notch or sinus on each side. Nasal groove oblong, with a long depressed line in front;

nostrils sub-basal, linear, longitudinal. Lower mandible with the angle very long and extremely narrow, the dorsal line ascending and slightly convex, the sides flattened and sloping outwards, the edges sharp, direct, obscurely serrulate, the tip extremely slender.

Head small, oblong, much compressed. Neck long. Body slender, much compressed. Legs longish, stout; tibia bare for about an inch, reticulated all round, the scales on the hind part larger; tarsus roundish, with numerous large scutella before, reticulated behind with angular scales; toes very long, slender, marginate, the fourth and third connected by a short web, not reaching the second joint of the former; first toe large, second longer than fourth, all covered with numerous large scutella above; claws long, slender, tapering, slightly arched, that of hind toe much larger and more arched.

Eyelids, and a large space before the eye, bare. Plumage loose, soft, and blended; hind part of neck in its whole length, and a large space on the fore part of the breast, without feathers, but covered, those on the neck being directed obliquely backwards. Wings rather short, broad, convex; primaries broad, rounded, the first pointed, shorter than the third, which is slightly exceeded by the second, the rest slowly graduated; secondaries very broad, rounded, the inner elongated so as slightly to exceed the primaries when the wing is closed. Tail very short, rounded, of *ten* feathers.

Bill dull yellowish-green, the ridge of the upper mandible brownish-black, of a lighter tint toward the base. Bare space before the eye brown; eyelids greenish-yellow; iris reddish-yellow. Feet dull yellowish-green; claws wood-brown. Upper part of the head brownish-grey; a streak of pale buff over the eye to behind the ear; a dusky streak from the posterior angle of the eye; the cheek and an oblique band to the middle of the neck light brownish-yellow; beneath which is a dusky brown line from the base of the lower mandible, continuous with a gradually enlarged band of black, which runs along the side of the neck; the upper parts yellowish-brown, patched, mottled, freckled, and barred with dark brown; alula, primary coverts, and most of the quills, deep bluish-grey, approaching to black; the tips of all these feathers light reddish-brown, dotted with bluish-grey. The fore part of the neck white above, yellowish-white beneath, the throat with a middle longitudinal line of yellowish-brown spots; on the rest of the neck each feather with a light brown central mark edged with darker, the rest of the lower parts dull yellowish-white, most of the feathers marked like those on the neck.

Length to end of tail 27 inches, to end of wings 26½, to carpal joint 17, to end of claws 32¾; extent of wings 45; wingfrom flexure 13¼; tail 4⅝; bill along the ridge 3⅜, along the edge of lower mandible 4½; breadth of mouth 1; depth of bill at base ⅝; bare part of tibia 1; tarsus 3⅝; hind toe

1⅛, its claw 1½; middle toe 3⅜; its claw 1; outer toe 2⅝, its claw ⅞; inner toe 2¼, its claw ⅛. Weight 1 lb. 7 oz.

The dimensions of a young male shot in autumn were as follows:

To end of tail 24 inches, to end of wings 24, to end of claws 29; extent of wings 26; wing from flexure 10½. Weight 1 lb. 1½ oz.

In dissecting this bird, the extreme compression of the body strikes one with surprise, its greatest breadth being scarcely an inch and a half, although it is capable of being much dilated. The great length and thickness of the neck are also remarkable; but these circumstances are not peculiar to the present species, being equally observed in many other Herons. On the roof of the mouth are three longitudinal ridges; the aperture of the posterior nares is linear, with an oblique flap on each side; the lower mandible is deeply concave, its crura elastic and expansile; the tongue 2 1/12 inches long, sagittate at the base with a single very slender papilla on each side, trigonal, tapering, flattened above; the width of the mouth is 10 twelfths; but the pharynx is much wider. The œsophagus, *a b c*, which is fifteen inches long, is very wide, having at its upper part, when inflated, a diameter of 2 inches, but gradually contracting to ½ inch at its entrance into the thorax, and again expanding to 1 inch. its walls are extremely thin, and when contracted, its mucous coat forms strongly marked longitudinal plaits. The proventriculus is very wide, its glandules oblong and arranged in a belt 10 twelfths in breadth. The stomach, *e*, is of moderate size, membranous, that is with its muscular coat very thin, and not forming lateral muscles; its tendinous spaces large and round, its inner coat smooth and soft; its greatest diameter 1 inch. There is a small roundish pyloric lobe, as in other Herons. Both lobes of the liver lie on the right side of the proventriculus; one, *i*, being 1 inch 10 twelfths, the other, *j*, 1 inch 2 twelfths long; the gall-bladder large, 11 twelfths long. The intestine is long and very slender, measuring 4 feet 7 inches, with a diameter of only 2 twelfths at its upper part, and 1½ twelfths at the lower,

when inflated; the rectum 4 inches long and 4 twelfths in diameter, its anterior extremity rounded, and having a minute papilliform termination, only 1 twelfth long.

The trachea, which is 12½ inches long, differs from that of ordinary Herons in being much compressed, especially at its upper and lower extremities; the middle part being less so. It is also proportionally wider, and its rings are narrower. At the top its diameter is 5 twelfths, at the middle 4½ twelfths, towards the lower part 4¾ twelfths, at the end 4¼ twelfths. The rings are osseous, in number 180; the five lower divided in front and behind, and much arched, the last measuring half an inch in a direct line between its extremities. The bronchi are in consequence very broad at their commencement, but gradually taper, and are composed of about 18 half rings. The contractor muscles are inconspicuous, the sterno-tracheal slender; and there is a single pair of inferior laryngeal, going to the first bronchial ring. The aperture of the glottis is 8 twelfths long, without any papillæ, but with a deep groove behind, and two thin-edged flaps.

In the digestive organs of this bird, there is nothing remarkably different from that of other Herons. The stomach contained remains of fishes and large coleopterous insects. The examination of the trachea, bronchi, and lungs, would not lead us to suppose that its cry is of the curious character represented, although it certainly would induce us to believe it different from that of ordinary Herons, which have the trachea narrower, round, and with broader and more bony rings.

Although in external appearance and habits it exhibits some affinity to the Rails, its digestive organs have no resemblance to theirs.

An egg presented by Dr. BREWER of Boston, measures two inches in length by one inch and a half, and is of a broadly oval shape, rather pointed at the smaller end, and of a uniform dull olivaceous tint.

THE LEAST BITTERN.

ARDEA EXILIS, *Wils.*

PLATE CCCLXVI.—MALE, FEMALE, AND YOUNG.

One morning while I was at the Cincinnati Museum, in the State of Ohio, a woman came in holding in her apron one of this delicate species alive, which she said had fallen down the chimney of her house under night, and which, when she awoke at daybreak, was the first object she saw, it having perched on one of the bed-posts. It was a young bird. I placed it on the table before me, and drew from it the figure on the left of my plate. It stood perfectly still for two hours, but on my touching it with a pencil, after my drawing was done, it flew off and alighted on the cornice of a window. Replacing it on the table, I took two books and laid them so as to leave before it a passage of an inch and a half, through which it walked with ease. Bringing the books nearer each other, so as to reduce the passage to one inch, I tried the Bittern again, and again it made its way between them without moving either. When dead, its body measured two inches and a quarter across, from which it is apparent that this species, as well as the Gallinules and Rails, is enabled to contract its breadth in an extraordinary degree.

While I was at Philadelphia, in September, 1832, a gentleman presented me with a pair of adult birds of this species, alive and in perfect plumage. They had been caught in a meadow a few miles below the city, and I kept them alive several days, feeding them on small fish and thin stripes of pork. They were expert at seizing flies, and swallowed caterpillars, and other insects. My wife admired them much on account of their gentle deportment. for although on being tormented, they would spread their wings, ruffle their feathers, and draw back their head as if to strike, yet they suffered themselves to be touched by any one without pecking at his hand. It was amusing to see them continually attempting to escape through the windows, climbing with ease from the floor to the top of the curtain by means of their feet and claws. This feat they would repeat whenever they were taken down. The experiment of the books was tried with them, and succeeded as at Cincinnati. At the approach of night they became much more lively, walked about the room in a graceful manner, with much agility, and generally kept close together. I had ample opportunities of studying their natu

Least Bittern.

Male 2 Female 3 Young.

Drawn from Nature by J.J.Audubon.FRS.FLS.

Lith.ª Printed & Col.ª by J.T.Bowen. Philad.ª

ral positions, and drew both of them in the attitudes exhibited in the plate. I would gladly have kept them longer; but as I was bound for the south, I had them killed for the purpose of preserving their skins.

This bird ranges over most part of the United States, but is nowhere to be found in tolerable abundance excepting about the mouths of the Mississippi and the southern portions of the Floridas, especially the "Everglades." I have met with them to the eastward as far as New Brunswick, on our large lakes, and in the intermediate portions of the country, although I have seldom found more than one or two at a time. In the Floridas and Carolinas they have been known to breed in small communities of four or five pairs. One instance of this was observed by my friend Dr. HOLBROOK of Charleston, and Dr. LEITNER, another friend of mine, found them quite abundant in certain portions of the Florida marshes.

Although the Least Bittern is not unfrequently started in salt marshes, it gives a decided preference to the borders of ponds, lakes or bayous of fresh water, and it is in secluded situations of this kind that it usually forms its nest. This is sometimes placed on the ground, amid the rankest grasses, but more frequently it is attached to the stems several inches above it. It is flat, composed of dried or rotten weeds, and in shape resembles that of the Louisiana Heron, although this latter employs nothing but sticks. The eggs are three or four, seldom more, of a dull yellowish-green, without spots, an inch and a quarter in length, almost equal at both ends.

When the young are yet quite small, their heads are covered with large tufts of reddish down, their bill is very short, and they sit on their rump with their legs extended on each side before their body, in the manner of young Herons. If disturbed when about two weeks old, they leave the nest and scramble through the grass with celerity, clinging to the blades with their sharp claws whenever this is necessary. At a later period they seem to await the coming of their parents with impatience; and if no noise is made, you may hear them calling continually in a low croaking voice for half an hour at a time. As soon as they are able to fly, they not unfrequently alight on the branches of trees to escape from their various enemies, such as minxes and water-snakes, the latter of which destroy a good number of them.

In two instances, I found the nests of the Least Bittern about three feet above the ground, in a thick cluster of smilax and other briary plants. In the first, two nests were placed in the same bush, within a few yards of each other. In the other instance there was only one nest of this bird, but several of the Boat-tailed Grakle, and one of the Green Heron, the occupants of all of which seemed to be on friendly terms. When startled from the nest, the old birds emit a few notes resembling the syllable *quā*, alight a few yards

off, and watch all your movements. If you go towards them, you may sometimes take the female with the hand, but rarely the male, who generally flies off, or makes his way through the woods. Its ordinary cry, however, is a rough croak, resembling that of the Great Blue Heron, but much weaker.

The flight of this bird is apparently weak by day, for then it seldom removes to a greater distance than a hundred yards at a time, and this, too, only when frightened in a moderate degree, for, if much alarmed, it falls again among the grass, in the manner of the Rail; but, in the dusk of the evening and morning, I have seen it pass steadily along, at the height of fifty yards or more, with the neck retracted, and the legs stretched out behind, in the manner of the larger Herons. On such occasions it uttered, at short intervals, its peculiar cry, and continued its flight until out of sight. Several individuals were together, and I imagined them to be proceeding in search of breeding-grounds, or on a migratory expedition. When disturbed by day, they fly with extended neck and dangling legs, and are easily shot, as their course is generally direct and their flight slow. When walking, it shoots its head forward at every step, as if about to thrust its bill into some substance; and if you attempt to lay hold of it when disabled, it is apt to inflict a painful wound.

The food of this bird consists of snails, slugs, tadpoles, or young frogs and water-lizards. In several instances, however, I have found small shrews and field-mice in their stomach. Although more nocturnal than diurnal, it moves a good deal about by day in search of food. About noon, being doubtless much fatigued, they are not unfrequently observed standing erect on one foot, and so soundly asleep as to be easily knocked down or even caught by the hand, if cautiously approached. This very remarkable habit of both our species of Bittern has brought upon them the charge of extreme *stupidity*, whence the name of *Butor* given to them by the Creoles of Louisiana. Whether or not this term be appropriate to the case, I leave for you to determine; but, my opinion is, that the animal truly deserving to be called stupid, yet remains to be discovered, and that the quality designated by that epithet occurs nowhere else than among the individuals of that species which so thoughtlessly applies the opprobrium.

At Cayo Island, Oppelousas, 13th April, 1837, Mr. HARRIS saw a flock of about twenty individuals of this species arriving from the westward, before a heavy gale from that quarter, all of which plunged, as it were, into the marsh, and hid themselves so closely, from fatigue or otherwise, that neither he nor the dog could raise one of them. We have now observed several species of Herons arriving in the same manner from the westward, and it seems that their stay in their roosting places continues only for a night, as on going to the same spot on the next day, none have been found.

At Galveston Island, on the 26th April, we saw many individuals of this species.

LEAST BITTERN, *Ardea exilis*, Wils. Amer. Orn., vol. viii. p. 37.
ARDEA EXILIS, Bonap. Syn., p. 308.
LEAST BITTERN, *Ardea exilis*, Nutt. Man., vol. ii. p. 66.
LEAST BITTERN, *Ardea exilis*, Aud. Orn. Biog., vol. iii. p. 77; vol. v. p. 606.

Male, 13½, 17¾. Female, 12, wing 4¾.

Resident in Florida. Migrates in spring eastward as far as Maine, and throughout the Western Country, far up the Missouri. Retires southward in winter. Texas.

Adult Male.

Bill longer than the head, slender, straight, tapering to a point, deeper than broad at the base, compressed towards the end. Upper mandible with its dorsal line almost straight, the ridge broad and rather rounded at the base, narrowed towards the end, the sides sloping, the edges very sharp, the tip acute. Nasal groove long; nostrils basal, linear, longitudinal. Lower mandible with the angle very long and narrow, the dorsal line sloping upwards, the sides nearly flat, the edges sharp and inflected, the tip very acute.

Head oblong, much compressed. Neck long. Body very slender, much compressed. Feet long, rather robust; tibia nearly entirely feathered; tarsi covered anteriorly with broad oblique scutella; toes scutellate above; hind toe stout, second and fourth nearly equal, third much longer; claws long, slender, arched, compressed, acute, that of middle toe serrated on the inner edge.

Eyelids and a large space before and beneath the eye, bare. Plumage soft, blended; feathers of the hind head elongated, as are those of the neck generally, but especially of its lower part anteriorly. Wings short, broad, rounded, the second quill longest. Tail very short, rounded, of twelve feathers.

Bill dark olive-brown above, edges of upper mandible and bare frontal space yellow; lower mandible pale yellow, inclining to flesh colour. Iris yellow. Feet dull greenish-yellow, claws brown. Upper part of the head, and the back, greenish-black and glossy; sides of the head and hind part of neck brownish-red or light chestnut; wing-coverts pale greyish-brown, quills purplish-grey, tipped with yellowish-brown, the inner secondaries broadly margined with light chestnut, of which colour also are the secondary coverts and the edge of the wing at the flexure; the tail greenish-black. The throat and fore neck are reddish-white; the rest of the lower parts are

of the same colour, excepting the fore part of the breast, which is blackish-brown, the feathers tipped with reddish-yellow, and the outer tibial feathers, which are reddish. In younger individuals the fore neck is more or less spotted with light brown, as was the case with that represented; but in old birds that part is unspotted.

Length to end of tail 13½ inches, to end of claws 16; to end of wings 12$\frac{4}{12}$; extent of wings 17¾; wing from flexure 5¾; tail 1$\frac{11}{12}$; bill along the ridge 1$\frac{2}{4}$, along the edge of lower mandible 2½; tarsus 1$\frac{8}{12}$; middle toe 1½, its claw $\frac{5}{12}$. Weight 4$\frac{2}{4}$ oz.

Adult Female.

The female is smaller, and differs considerably from the male in colour. The bare parts and iris are the same. The upper part of the head is reddish-brown, with a tinge of green; the back and scapulars are dark chestnut, and there is a line of yellowish-white along each side of the back, formed by the outer edges of the feathers. The rump is darker, the tail bluish-black, as in the male. In other respects the colouring is similar, but the feathers of the fore neck and sides have each a narrow central line of dark brown.

Length to end of tail 12 inches; wing from flexure 4¾; tail 1¾; bill along the ridge 1¾, along the edge of lower mandible 2$\frac{3}{12}$; tarsus 1½; middle toe 1$\frac{5}{12}$, its claw $\frac{5}{12}$. Weight 3½ oz.

Young in first plumage.

The young has the bill, eyes, and feet nearly of the same tints as the old; but the upper parts of the plumage are generally of a light brownish-red, variegated with brownish-yellow; the primary quills and tail black.

I have lately received a letter from my friend JOHN BACHMAN, stating that he had found this species breeding in considerable numbers on the plantation of JAMES H. SMITH, Esq., six miles east of Charleston, where he procured specimens both of the birds and of their eggs. Mr. SMITH'S sons had killed, in the course of a couple of weeks, not less than fourteen of these diminutive Herons. He describes the nest as flat, composed of pieces of dry rushes about a foot in length, and placed in a bunch of *Juncus effusus*. The eggs were nearly white, with a very light tinge of blue.

In an adult male preserved in spirits, the interior of the mouth is of the same structure as in the other Herons; the tongue 1 inch 4 twelfths long, very slender, trigonal, tapering to a point. Width of mouth 5 twelfths. Œsophagus 8 inches long, its width at the upper part 1 inch 2 twelfths, gradually tapering to 8 twelfths, and within the thorax enlarged to 10 twelfths. Belt of proventricular glandules ½ inch in breadth. Stomach large, 1 inch in diameter, its tendons 3 twelfths in breadth, its walls extremely thin, being quite membranous. The contents are three small fishes, and remains of others. Lobes of the liver unequal, the right 1¼ inches, the left 1 inch in

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Green Heron

length; gall-bladder 8 twelfths long, 2½ twelfths in breadth. Intestine 2 feet 9½ inches long, ⅛ twelfth wide in the duodenal portion, gradually diminishing to ½ twelfth; cœcum a small knob nearly 1 twelfth long, and of the same breadth; rectum 2½ inches long, and 2 twelfths in width; cloaca globular, ½ inch in diameter. It forms 20 folds.

Trachea 6 inches long, 1 twelfth in breadth; its rings 170, and 4 dimidiate. Bronchi very wide, of 12 rings.

GREEN HERON.

ARDEA VIRESCENS, *Linn.*

PLATE CCCLXVII.—MALE AND YOUNG.

This species is more generally known than any of our Herons, it being very extensively dispersed in spring, summer, and early autumn. It ranges along our many rivers to great distances from the sea, being common on the Missouri and its branches, from which it spreads to all such localities as are favourable to its habits. To the north of the United States, however, it is very seldom seen, it being of rare occurrence even in Nova Scotia. At the approach of winter it retires to the Floridas and Lower Louisiana, where individuals, however, reside all the year, and many remove southward beyond the limits of our country. I have observed their return in early spring, when arriving in flocks of from twenty to fifty individuals. They would plunge downwards from their elevated line of march, cutting various zigzags, until they would all simultaneously alight on the tops of the trees or bushes of some swampy place, or on the borders of miry ponds. These halts took place pretty regularly about an hour after sun-rise. The day was occupied by them, as well as by some other species, especially the Blue, the Yellow-crowned, and Night Herons, all of which at this period travelled eastward, in resting, cleansing their bodies, and searching for food. When the sun approached the western horizon, they would at once ascend in the air, arrange their lines, and commence their flight, which, I have no doubt, continued all night. You may therefore, good reader, conclude that Herons are not only diurnal birds when feeding, but also able to travel at night when

the powerful impulse of migration urges them from one portion of the country to another. But although on their northward journey, the Green Herons travel in flocks, it is a curious fact, that, unlike our smaller Waders, Ducks, Geese, and Cranes, they usually return southward at the approach of winter singly or in very small flocks.

Stagnant pools or bayous, and the margins of the most limpid streams, are alike resorted to by this species for the purpose of procuring food. It is little alarmed by the presence of man, and you may often see it close to houses on the mill-dams, or even raising its brood on the trees of gardens. This is often the case in the suburbs of Charleston, in South Carolina, where I have seen several nests on the same live oak in the grounds of the Honourable JOEL R. POINSETT, as well as in those of other cities of the Southern States. The gentleness, or as many would say, the stupidity of this bird is truly remarkable, for it will at times allow you to approach within a few paces, looking as unconcernedly upon you as the House Sparrow is wont to do in the streets of London.

Although they not unfrequently breed in single pairs, they also associate, not only forming communities of their own kind, but mingling with the larger species of their tribe, and with the Boat-tailed Grakles, and other birds. On the 23d of May, 1831, I found two nests of the Green Heron on one of the Florida Keys, close to some of *Ardea rufescens* and *A. cærulea*. Now and then a dozen or more of their nests are found on a bunch of vines in the middle of a pond, and placed within two or three feet of the water; while in other cases, they place their tenements on the highest branches of tall cypresses. In our Middle Districts, however, and especially at some distance from the sea, it is very seldom that more than a single nest is seen in one locality.

The nest of the Green Heron, like that of almost every other species of the tribe, is flat and composed of sticks, loosely arranged, among which are sometimes green twigs with their leaves still attached. The eggs are three or four, seldom more, an inch and three-eighths in length, an inch and one-eighth in breadth, nearly equally rounded at both ends, and of a delicate sea-green colour. According to the locality, they are deposited from the middle of March to the beginning of June. In the Southern States, two broods are frequently reared, but in the Middle and Northern Districts, seldom more than one.

The young, which are at first of a deep livid colour, sparingly covered here and there, and more especially about the head, with longish tufts of soft hair-like down, of a brownish colour, remain in the nest until nearly able to fly; but if disturbed, at once leave their couch, and scramble along

the branches, clinging to them with their feet, so as not to be easily drawn off.

After the spring migration is over, the flight of this species is rather feeble, and when they are passing from one spot to another, they frequently use a stronger flap of their wings at intervals. On such occasions, they scarcely contract their neck; but when travelling to a considerable distance, they draw it in like all other species of the tribe, and advance with regular and firm movements of their wings. When alighting to rest, they come down with such force, that their passage causes a rustling sound like that produced by birds of prey when pouncing on their quarry, and on perching they stretch up their neck and jerk their tail repeatedly for some time, as they are also wont to do on any other occasion when alarmed.

The Green Herons feed all day long, but, as I think, rarely at night. Their food consists of frogs, fishes, snails, tadpoles, water-lizards, crabs, and small quadrupeds, all of which they procure without much exertion, they being abundant in the places to which they usually resort. Their gait is light, but firm. During the love-season they exhibit many curious gestures, erecting all the feathers of their neck, swelling their throat, and uttering a rough guttural note like *qua, qua*, several times repeated by the male as he struts before the female. This note is also usually emitted when they are started, but when fairly on wing they proceed in silence. The flesh of this species affords tolerable eating, and Green Herons are not unfrequently seen in the markets of our southern cities, especially of New Orleans.

The young attain their full beauty in the second spring, but continue to grow for at least another year. The changes which they exhibit, although by no means so remarkable as those of *Ardea rufescens* and *A. cærulea*, have proved sufficient to cause mistakes among authors who had nothing but skins on which to found their decisions. I have given figures of an adult in full plumage, and of an immature bird, to enable you to judge how carefully *Nature* ought to be studied to enable you to keep free of mistakes.

GREEN HERON, *Ardea virescens*, Wils. Amer. Orn., vol. viii. p. 97.
ARDEA VIRESCENS, Bonap. Syn., p. 307.
GREEN HERON, Nutt. Man., vol. ii. p. 63.
GREEN HERON, *Ardea virescens*, Aud. Orn. Biog., vol. iv. p. 274.

Male, 17¾, 27. Female, 17, 25.

Resident in the Floridas and along the Gulf of Mexico to Texas. In spring and summer disperses over the whole country as far as Maine, and up the Missouri. Returns southward at the approach of winter. Very common.

Adult Male.

Bill longer than the head, straight, rather slender, tapering to a very acute point, higher than broad at the base, compressed towards the end. Upper mandible with its dorsal line very slightly arched, the ridge broad and rather flattened at the base, narrowed towards the end, the sides sloping, erect towards the edges, which are sharp and direct, the tip acute. Nasal depression long, with a groove extending to near the point; nostrils basal, linear, longitudinal. Lower mandible with the angle very long and narrow, the dorsal line sloping upwards, the sides sloping outwards and nearly flat, the edges sharp, the tip acuminate.

Head oblong, much compressed. Neck long. Body very slender, much compressed. Feet rather long, moderately stout; tibia bare for about an inch; tarsi of moderate length, covered with hexagonal scales, of which some of the anterior are much larger and scutelliform. Toes rather long and slender, with numerous scutella above; hind toe stout, second and fourth nearly equal, third much longer; claws rather long, slender, arched, compressed, acute, that of middle toe expanded and serrated on the inner edge.

A large space extending from the bill to behind the eye bare. Plumage very soft, loose, and blended; feathers of the hind head elongated and erectile, as are those of the neck generally, but especially of its hind and lower anterior parts; of the fore part of the back much elongated and acuminate; scapulars very large. Wings short, very broad, rounded; second and third quills equal and longest, first and fourth equal and but slightly shorter, the rest slowly graduated; secondaries broad and rounded. Tail very short, even, of twelve broad soft feathers.

Bill greenish-black above, bright yellow beneath. Iris and bare part about the eye also bright yellow. Feet greenish-yellow, claws dusky. Upper part of the head and nape glossy deep green. Neck purplish-red, tinged with lilac behind, and having anteriorly a longitudinal band of white, spotted with dusky-brown; a similar white band along the base of lower mandible to beyond the eye. Elongated feathers of the back greyish-green, in some lights bluish-grey, with the shafts bluish-white; the rest of the back similar; the upper tail-coverts and tail bluish-green; the lateral feathers slightly margined with white. Scapulars, wing-coverts, and inner secondaries, deep glossy green, bordered with yellowish-white; primary quills and outer secondaries greyish-blue, tinged with green. Lower parts pale purplish-brown, tinged with grey; axillary feathers purplish-grey, as are some of the lower wing-coverts; lower tail-coverts greyish-white.

Length to end of tail 17¾ inches, to end of wings 17¼, to end of claws 24, to carpal joint 11¼; extent of wings 27; wing from flexure 7⅝; tail 3¾; bill along the ridge 2¼, along the edge of lower mandible 3¼; bare part of tibia

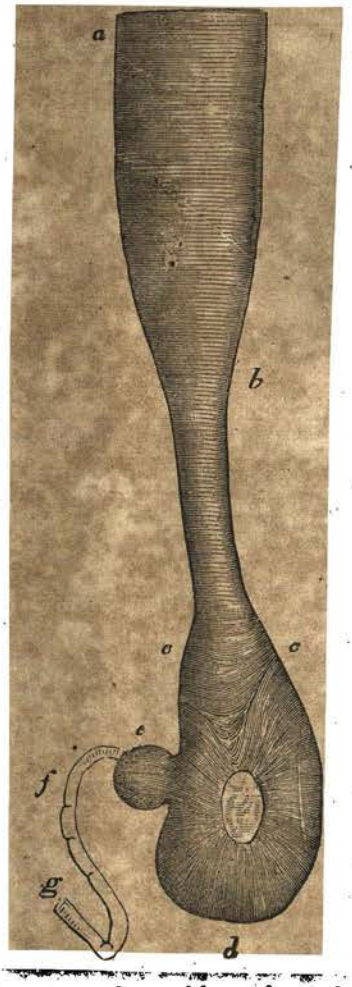
$1\frac{9}{12}$; tarsus 2; hind toe $\frac{7}{8}$, its claw $\frac{1}{2}$; middle toe $1\frac{1}{8}$, its claw $\frac{21}{32}$, inner toe $1\frac{3}{8}$, its claw $\frac{1}{4}$; outer toe $1\frac{3}{8}$, its claw $\frac{1}{4}$. Weight $7\frac{1}{2}$ oz.

The female is considerably smaller, but otherwise similar.

Length to end of tail 17 inches, to end of wings 17, to end of claws $21\frac{3}{4}$, extent of wings 25. Weight $6\frac{1}{4}$ oz.

Young fully fledged.

The bill dull greyish-green, the lower mandible lighter; bare space around the eye greenish-blue, with the exception of a streak of yellow at the upper part. Iris yellow. Feet greenish-yellow, duller than in the adult. The hind neck light brownish-red, the fore part of the neck and all the under parts white, longitudinally streaked with brownish-red, some of the long feathers on the sides of the neck also white. At this age there are no elongated feathers on the back, which is greenish-blue, as well as the scapulars and tail-feathers. Wing as in the adult, but the smaller feathers on its anterior part more red, the coverts with a small triangular tip of white, and the quills narrowly tipped and margined with the same.



Length to end of tail $17\frac{1}{2}$ inches, to end of wings 17, to end of claws 23; extent of wings 25. Weight $6\frac{1}{2}$ oz.

The roof of the mouth is anteriorly a little concave, with a median prominent line; the palate convex; the lower jaw with a kind of joint about an inch from the base, its intercrural membrane or skin very extensile. The tongue is $1\frac{7}{12}$ inches long, very slender, trigonal, emarginate at the base, with a groove along the middle, and pointed. Posterior apertures of nares linear, $\frac{1}{2}$ inch long. Œsophagus, *a*, *b*, *c*, 10 inches long, its walls delicate, its diameter at the upper part $1\frac{1}{4}$ inches, gradually contracting to $\frac{1}{2}$ inch at its entrance into the thorax. The lobes of the liver unequal, the right 1 inch 5 twelfths long, the left 11 twelfths; the gall-bladder large, 7 twelfths long. The stomach, *c d*, is membranous, of an oblong form, 9 twelfths long, 10 twelfths in breadth; its tendons elliptical, 5 twelfths by 3 twelfths. The proventriculus, *c c*, 9 twelfths long, with a complete belt

of oblong glandules. There is a small roundish pyloric lobe, *e*. Intestine, *f*, *g*, 2 feet 11 inches long, its diameter uniform, 1 twelfth, or about the thickness of a crow's quill. Rectum enlarged to 3 twelfths, and 3¼ inches long, its cœcal extremity rounded, and only 1 twelfth long.

The trachea is 7¼ inches long, of nearly uniform diameter, averaging 2 twelfths; the rings 160, nearly circular and ossified. The bronchial half-rings about 18. The lateral muscles are very inconspicuous; sterno-tracheals, and a pair of inferior laryngeal, going to the first bronchial rings.

The Herons generally differ from the other Grallæ in having the œsophagus much wider, and similar to that of the fish-eating palmipedes; the stomach in a manner membranous, like that of the rapacious land-birds, without lateral muscles or strong epithelium; the intestine extremely slender, and the anterior extremity of the large intestine or rectum furnished with a single cœcum, in place of two, as in almost all other birds.

THE GREAT WHITE HERON.

ARDEA OCCIDENTALIS, *Aud.*

PLATE CCCLXVIII.—MALE.

I am now about to present you with an account of the habits of the largest species of the Heron tribe hitherto found in the United States, and which is indeed remarkable not only for its great size, but also for the pure white of its plumage at every period of its life. Writers who have subdivided the family, and stated that none of the true Herons are white, will doubtless be startled when they, for the first time, look at my plate of this bird. I think, however, that our endeavours to discover the natural arrangement of things cannot be uniformly successful, and it is clear that he only who has studied *all* can have much chance of disposing all according to their relations.

On the 24th of April, 1832, I landed on Indian Key in Florida, and immediately after formed an acquaintance with Mr. EGAN. He it was who first gave me notice of the species which forms the subject of this article, and of which I cannot find any description. The next day after that of my

Great White Heron

Male adult Spring Plumage

Drawn from Nature by J.J. Audubon F.R.S.F.L.S

Lith.d Printed & Col.d by J. T. Bowen Phila.d

arrival, when I was prevented from accompanying him by my anxiety to finish a drawing, he came in with two young birds alive, and another lying dead in a nest, which he had cut off from a mangrove. You may imagine how delighted I was, when at the very first glance I felt assured that they were different from any that I had previously seen. The two living birds were of a beautiful white, slightly tinged with cream-colour, remarkably fat and strong for their age, which the worthy pilot said could not be more than three weeks. The dead bird was quite putrid and much smaller. It looked as if it had accidentally been trampled to death by the parent birds ten or twelve days before, the body being almost flat and covered with filth. The nest with the two live birds was placed in the yard. The young Herons seemed quite unconcerned when a person approached them, although on displaying one's hand to them, they at once endeavoured to strike it with their bill. My Newfoundland dog, a well-trained and most sagacious animal, was whistled for and came up; on which the birds rose partially on their legs, ruffled all their feathers, spread their wings, opened their bills, and clicked their mandibles in great anger, but without attempting to leave the nest. I ordered the dog to go near them, but not to hurt them. They waited until he went within striking distance, when the largest suddenly hit him with its bill, and hung to his nose. Plato, however, took it all in good part, and merely brought the bird towards me, when I seized it by the wings, which made it let go its hold. It walked off as proudly as any of its tribe, and I was delighted to find it possessed of so much courage. These birds were left under the charge of Mrs. EGAN, until I returned from my various excursions to the different islands along the coast.

On the 26th of the same month, Mr. THRUSTON took me and my companions in his beautiful barge to some keys on which the Florida Cormorants were breeding in great numbers. As we were on the way we observed two tall White Herons standing on their nests; but although I was anxious to procure them alive, an unfortunate shot from one of the party brought them to the water. They were, I was told, able to fly, but probably had never seen a man before. While searching that day for nests of the Zenaida Dove, we observed a young Heron of this species stalking among the mangroves that bordered the key on which we were, and immediately pursued it. Had you been looking on, good reader, you might have enjoyed a hearty laugh, although few of us could have joined you. Seven or eight persons were engaged in the pursuit of this single bird, which, with extended neck, wings, and legs, made off among the tangled trees at such a rate, that, anxious as I was to obtain it alive, I several times thought of shooting it. At length, however, it was caught, its bill was securely tied, its legs were drawn up, and fastened by a strong cord, and the poor thing was thus

conveyed to Indian Key, and placed along with its kinsfolk. On seeing it, the latter immediately ran towards it with open bills, and greeted it with a most friendly welcome, passing their heads over and under its own in the most curious and indeed ludicrous manner. A bucketful of fish was thrown to them, which they swallowed in a few minutes. After a few days, they also ate pieces of pork-rind, cheese, and other substances.

While sailing along the numerous islands that occur between Indian Key and Key West, I saw many birds of this species, some in pairs, some single, and others in flocks; but on no occasion did I succeed in getting within shot of one. Mr. EGAN consoled me by saying that he knew some places beyond Key West where I certainly should obtain several, were we to spend a day and a night there for the purpose. Dr. BENJAMIN STROBEL afterwards gave me a similar assurance. In the course of a week after reaching Key West, I in fact procured more than a dozen birds of different ages, as well as nests and eggs, and their habits were carefully examined by several of my party.

At three o'clock one morning, you might have seen Mr. EGAN and myself, about eight miles from our harbour, paddling as silently as possible over some narrow and tortuous inlets, formed by the tides through a large flat and partially submersed key. There we expected to find many White Herons; but our labour was for a long time almost hopeless, for, although other birds occurred, we had determined to shoot nothing but the Great White Heron, and none of that species came near us. At length, after six or seven hours of hard labour, a Heron flew right over our heads, and to make sure of it, we both fired at once. The bird came down dead. It proved to be a female, which had either been sitting on her eggs or had lately hatched her young, her belly being bare, and her plumage considerably worn. We now rested awhile, and breakfasted on some biscuit soaked in molasses and water, reposing under the shade of the mangroves, where the mosquitoes had a good opportunity of breaking their fast also. We went about from one key to another, saw a great number of White Herons, and at length, towards night, reached the Marion, rather exhausted, and having a solitary bird. Mr. EGAN and I had been most of the time devising schemes for procuring others with less trouble, a task which might easily have been accomplished a month before, when, as he said, the birds were "sitting hard." He asked if I would return that night at twelve o'clock to the last key which we had visited. I mentioned the proposal to our worthy Captain, who, ever willing to do all in his power to oblige me, when the service did not require constant attendance on board, said that if I would go, he would accompany us in the gig. Our guns were soon cleaned, provisions

and ammunition placed in the boats, and after supping we talked and laughed until the appointed time.

"Eight Bells" made us bound on our feet, and off we pushed for the islands. The moon shone bright in the clear sky; but as the breeze had died away, we betook ourselves to our oars. The state of the tide was against us, and we had to drag our boats several miles over the soapy shallows; but at last we found ourselves in a deep channel beneath the hanging mangroves of a large key, where we had observed the Herons retiring to roost the previous evening. There we lay quietly until day-break. But the musquitoes and sandflies! Reader, if you have not been in such a place, you cannot easily conceive the torments we endured for a whole hour, when it was absolutely necessary for us to remain perfectly motionless. At length day dawned, and the boats parted, to meet on the other side of the key. Slowly and silently each advanced. A Heron sprung from its perch almost directly over our heads. Three barrels were discharged,—in vain; the bird flew on unscathed; the pilot and I had probably been too anxious. As the bird sped away, it croaked loudly, and the noise, together with the report of our guns, roused some hundreds of these Herons, which flew from the mangroves, and in the grey light appeared to sail over and around us like so many spectres. I almost despaired of procuring any more. The tide was now rising, and when we met with the other boat we were told, that if we had waited until we could have shot at them while perched, we might have killed several; but that now we must remain until full tide, for the birds had gone to their feeding grounds.

The boats parted again, and it was now arranged that whenever a Heron was killed, another shot should be fired exactly one minute after, by which each party would be made aware of the success of the other. Mr. EGAN, pointing to a nest on which stood two small young birds, desired to be landed near it. I proceeded into a narrow bayou, where we remained quiet for about half an hour, when a Heron flew over us and was shot. It was a very fine old male. Before firing my signal shot, I heard a report from afar, and a little after mine was discharged I heard another shot, so I felt assured that two birds had been killed. When I reached the Captain's boat I found that he had in fact obtained two; but Mr. EGAN had waited two hours in vain near the nest, for none of the old birds came up. We took him from his hiding place, and brought the Herons along with us. It was now nearly high water. About a mile from us, more than a hundred Herons stood on a mud-bar up to their bellies. The pilot said that now was our best chance, as the tide would soon force them to fly, when they would come to rest on the trees. So we divided, each choosing his own place, and I went to the

lowest end of the key, where it was separated from another by a channel. I soon had the pleasure of observing all the Herons take to wing, one after another, in quick succession. I then heard my companions' guns, but no signal of success. Obtaining a good chance, as I thought, I fired at a remarkably large bird, and distinctly heard the shot strike it. The Heron merely croaked, and pursued its course. Not another bird came near enough to be shot at, although many had alighted on the neighbouring key, and stood perched like so many newly finished statues of the purest alabaster, forming a fine contrast to the deep blue sky. The boats joined us. Mr. EGAN had one bird, the Captain another, and both looked at me with surprise. We now started for the next key, where we expected to see more. When we had advanced several hundred yards along its low banks, we found the bird at which I had shot lying with extended wings in the agonies of death. It was from this specimen that the drawing was made. I was satisfied with the fruits of this day's excursion. On other occasions I procured fifteen more birds, and judging that number sufficient, I left the Herons to their occupations.

This species is extremely shy. Sometimes they would rise when at the distance of half a mile from us, and fly quite out of sight. If pursued, they would return to the very keys or mud-flats from which they had risen, and it was almost impossible to approach one while perched or standing in the water. Indeed, I have no doubt that half a dozen specimens of *Ardea Herodias* could be procured for one of the present, in the same time and under similar circumstances.

The Great White Heron is a constant resident on the Florida Keys, where it is found more abundant during the breeding season than anywhere else. They rarely go as far eastward as Cape Florida, and are not seen on the Tortugas, probably because these islands are destitute of mangroves. They begin to pair early in March, but many do not lay their eggs until the middle of April. Their courtships were represented to me as similar to those of the Great Blue Heron. Their nests are at times met with at considerable distances from each other, and although many are found on the same keys, they are placed farther apart than those of the species just mentioned. They are seldom more than a few feet above high-water-mark, which in the Floridas is so low, that they look as if only a yard or two above the roots of the trees. From twenty to thirty nests which I examined were thus placed. They were large, about three feet in diameter, formed of sticks of different sizes, but without any appearance of lining, and quite flat, being several inches thick. The eggs are always three, measure two inches and three quarters in length, one inch and eight-twelfths in breadth, and have a rather thick shell, of a uniform plain light bluish-green colour. Mr.

EGAN told me that incubation continues about thirty days, that both birds sit, (the female, however, being most assiduous,) and with their legs stretched out before them, in the same manner as the young when two or three weeks old. The latter, of which I saw several from ten days to a month old, were pure white, slightly tinged with cream colour, and had no indications of a crest. Those which I carried to Charleston, and which were kept for more than a year, exhibited nothing of the kind. I am unable to say how long it is before they attain their full plumage as represented in the plate, when, as you see, the head is broadly but loosely and shortly tufted, the feathers of the breast pendent, but not remarkably long, and there are none of the narrow feathers seen in other species over the rump or wings.

These Herons are sedate, quiet, and perhaps even less animated than the *A. Herodias*. They walk majestically, with firmness and great elegance. Unlike the species just named, they *flock* at their feeding grounds, sometimes a hundred or more being seen together; and what is still more remarkable is, that they betake themselves to the mud-flats or sandbars at a distance from the keys on which they roost and breed. They seem, in so far as I could judge, to be diurnal, an opinion corroborated by the testimony of Mr. EGAN, a person of great judgment, sagacity, and integrity. While on these banks, they stand motionless, rarely moving towards their prey, but waiting until it comes near, when they strike it and swallow it alive, or when large beat it on the water, or shake it violently, biting it severely all the while. They never leave their feeding grounds until driven off by the tide, remaining until the water reaches their body. So wary are they, that although they may return to roost on the same keys, they rarely alight on trees to which they have resorted before, and if repeatedly disturbed they do not return, for many weeks at least. When roosting, they generally stand on one foot, the other being drawn up, and, unlike the Ibises, are never seen lying flat on trees, where, however, they draw in their long neck, and place their head under their wing.

I was often surprised to see that while a flock was resting by day in the position just described, one or more stood with outstretched necks, keenly eyeing all around, now and then suddenly starting at the sight of a Porpoise or Shark in chase of some fish. The appearance of a man or a boat, seemed to distract them; and yet I was told that nobody ever goes in pursuit of them. If surprised, they leave their perch with a rough croaking sound, and fly directly to a great distance, but never inland.

The flight of the Great White Heron is firm, regular, and greatly protracted. They propel themselves by regular slow flaps, the head being drawn in after they have proceeded a few yards, and their legs extended behind, as is the case with all other Herons. They also now and then rise

high in the air, where they sail in wide circles, and they never alight without performing this circling flight, unless when going to feeding grounds on which other individuals have already settled. It is truly surprising that a bird of so powerful a flight never visits Georgia or the Carolinas, nor goes to the mainland. When you see them about the middle of the day on their feeding grounds they "loom" to about double their size, and present a singular appearance. It is difficult to kill them unless with buck-shot, which we found ourselves obliged to use.

When I left Key West, on our return towards Charleston, I took with me two young birds that had been consigned to the care of my friend Dr. B. STROBEL, who assured me that they devoured more than their weight of food per day. I had also two young birds of the *Ardea Herodias* alive. After bringing them on board, I placed them altogether in a very large coop; but was soon obliged to separate the two species, for the white birds would not be reconciled to the blue, which they would have killed. While the former had the privilege of the deck for a few minutes, they struck at the smaller species, such as the young of *Ardea rufescens* and *A. Ludoviciana*, some of which they instantly killed and swallowed entire, although they were abundantly fed on the flesh of green turtles. None of the sailors succeeded in making friends with them.

On reaching Indian Key, I found those which had been left with Mrs. EGAN, in excellent health and much increased in size, but to my surprise observed that their bills were much broken, which she assured me had been caused by the great force with which they struck at the fishes thrown to them on the rocks of their enclosure,—a statement which I found confirmed by my own observation in the course of the day. It was almost as difficult to catch them in the yard, as if they had never seen a man before, and we were obliged to tie their bills fast, to avoid being wounded by them while carrying them on board. They thrived well, and never manifested the least animosity towards each other. One of them which accidentally walked before the coop in which the Blue Herons were, thrust its bill between the bars, and transfixed the head of one of these birds, so that it was instantaneously killed.

When we arrived at Charleston, four of them were still alive. They were taken to my friend JOHN BACHMAN, who was glad to see them. He kept a pair, and offered the other to our mutual friend Dr. SAMUEL WILSON, who accepted them, but soon afterwards gave them to Dr. GIBBES of Columbia College, merely because they had killed a number of Ducks. My friend BACHMAN kept two of these birds for many months; but it was difficult for him to procure fish enough for them, as they swallowed a bucketful of mullets in a few minutes, each devouring about a gallon of these fishes

They betook themselves to roosting in a beautiful arbour in his garden; where at night they looked with their pure white plumage like beings of another world. It is a curious fact, that the points of their bills, of which an inch at least had been broken, grew again, and were as regularly shaped at the end of six months as if nothing had happened to them. In the evening or early in the morning, they would frequently set, like pointer dogs, at moths which hovered over the flowers, and with a well-directed stroke of their bill seize the fluttering insect and instantly swallow it. On many occasions, they also struck at chickens, grown fowls and ducks, which they would tear up and devour. Once a cat, which was asleep in the sunshine, on the wooden steps of the veranda, was pinned through the body to the boards and killed by one of them. At last they began to pursue the younger children of my worthy friend, who therefore ordered them to be killed. One of them was beautifully mounted by my assistant Mr. HENRY WARD, and is now in the Museum of Charleston. Dr. GIBBES was obliged to treat his in the same manner; and I afterwards saw one of them in his collection.

Mr. EGAN kept for about a year one of these birds, which he raised from the nest, and which, when well grown, was allowed to ramble along the shores of Indian Key in quest of food. One of the wings had been cut, and the bird was known to all the resident inhabitants, but was at last shot by some Indian hunter, who had gone there to dispose of a collection of sea shells.

Some of the Herons feed on the berries of certain trees during the latter part of autumn and the beginning of winter. Dr. B. STROBEL observed the Night Heron eating those of the "Gobolimbo," late in September at Key West.

Among the varied and contradictory descriptions of Herons, you will find it alleged that these birds seize fish while on wing by plunging the head and neck into the water; but this seems to me extremely doubtful. Nor, I believe, do they watch for their prey while perched on trees. Another opinion is, that Herons are always thin, and unfit for food. This, however, is by no means generally the case in America, and I have thought these birds very good eating when not too old.

GREAT WHITE HERON, *Ardea occidentalis*, Aud. Orn. Biog., vol. iii. p. 542; vol. v. p. 596.

Male, 54, 83. Female, 50, 75.

Resident in the southern Florida Keys. Texas. Never seen to the eastward of Cape Florida, nor on the mainland. Common.

Adult Male.

Bill much longer than the head, straight, compressed, tapering to a point, the mandibles nearly equal, but the point of the upper considerably extended beyond that of the lower. Upper mandible with the dorsal line nearly straight, the ridge broadly convex at the base, convex and narrowed towards the end, a groove from the base to near the tip, beneath which the sides are convex, the edges extremely thin and sharp; towards the end broken into irregular serratures, the tip acute. Lower mandible with the angle extremely narrow and elongated, the dorsal line beyond it ascending and slightly curved, the ridge convex, the sides ascending and slightly concave, the edges as in the upper, the tip acuminate. Nostrils basal, linear-oblong, longitudinal, with a membrane above and behind.

Head of moderate size, oblong, compressed. Neck extremely long, slender. Body slender and compressed; wings large. Feet very long; tibia elongated, its lower half bare, very slender, covered all round with large elongated hexagonal scales; tarsus long, thicker than the lower part of the tibia, compressed, covered anteriorly with large scutella, excepting at the two extremities where there are large angular scales. Toes of moderate length, rather slender, scutellate above, flattened, and reticularly granulate beneath, the thick margins covered with small scales, the sides with larger; the third and fourth toes connected at the base by a reticulated web; the third toe much longer than the fourth, which is considerably longer than the second, the first about half the length of the third; claws of moderate size, strong, compressed, curved, obtuse, the first largest, the third next in size, and with an inner regularly pectinated edge, all more or less convex beneath.

Space between the bill and eye, and around the latter, as well as at the angle of the mouth bare, as is the lower half of the tibia. Plumage soft, the edges of the feathers loose and blended. Feathers of the upper part of the head and hind neck elongated and tapering; of the back long and loose, of the rump soft and downy; scapulars very long, rather compact, the upper loose. Feathers of the fore-neck elongated, of the sides of the breast anteriorly very long, loose and tapering; of the rest of the lower parts broader but pointed; of the tibia shortish. Wings large, rounded; primaries curved, strong, broad, tapering, the three first slightly sinuate on the inner web; third quill longest, fourth scarcely shorter, third almost as long as fourth, first a quarter of an inch shorter; secondaries very large, broad and rounded, the inner extending as far as the longest primary when the wing is closed. Tail short, slightly rounded, of twelve broad, rounded feathers.

Bill yellow, the upper mandible dusky green at its base; loral space yellowish-green; orbital space light blue. Iris bright yellow. Tibia and hind part of tarsus yellow; fore part of tibia and toes olivaceous, sides of the

latter greenish-yellow; claws light brown. The whole of the plumage is pure white.

Length to end of tail 54 inches, to end of wings 54, to end of claws 70; extent of wings 88; wing from flexure 19; tail 7; bill along the back 6¾, along the edges 8¾; bare part of tibia 6; tarsus 8½; middle toe 4$\frac{11}{12}$, its claw $\frac{11}{12}$. Weight 9½ lbs.

The Female is smaller, but similar to the male. The dimensions of an individual were as follows.

Length to end of tail 50, to end of wings 50, to end of claws 65; extent of wings 75; wing from flexure 18¾; tail 6¼; bill along the back 5$\frac{11}{12}$, along the edges 7¾, its depth at base 1$\frac{5}{12}$; tarsus 7½; middle toe 4¼, its claw $\frac{9}{12}$. Weight 7¼ lbs.

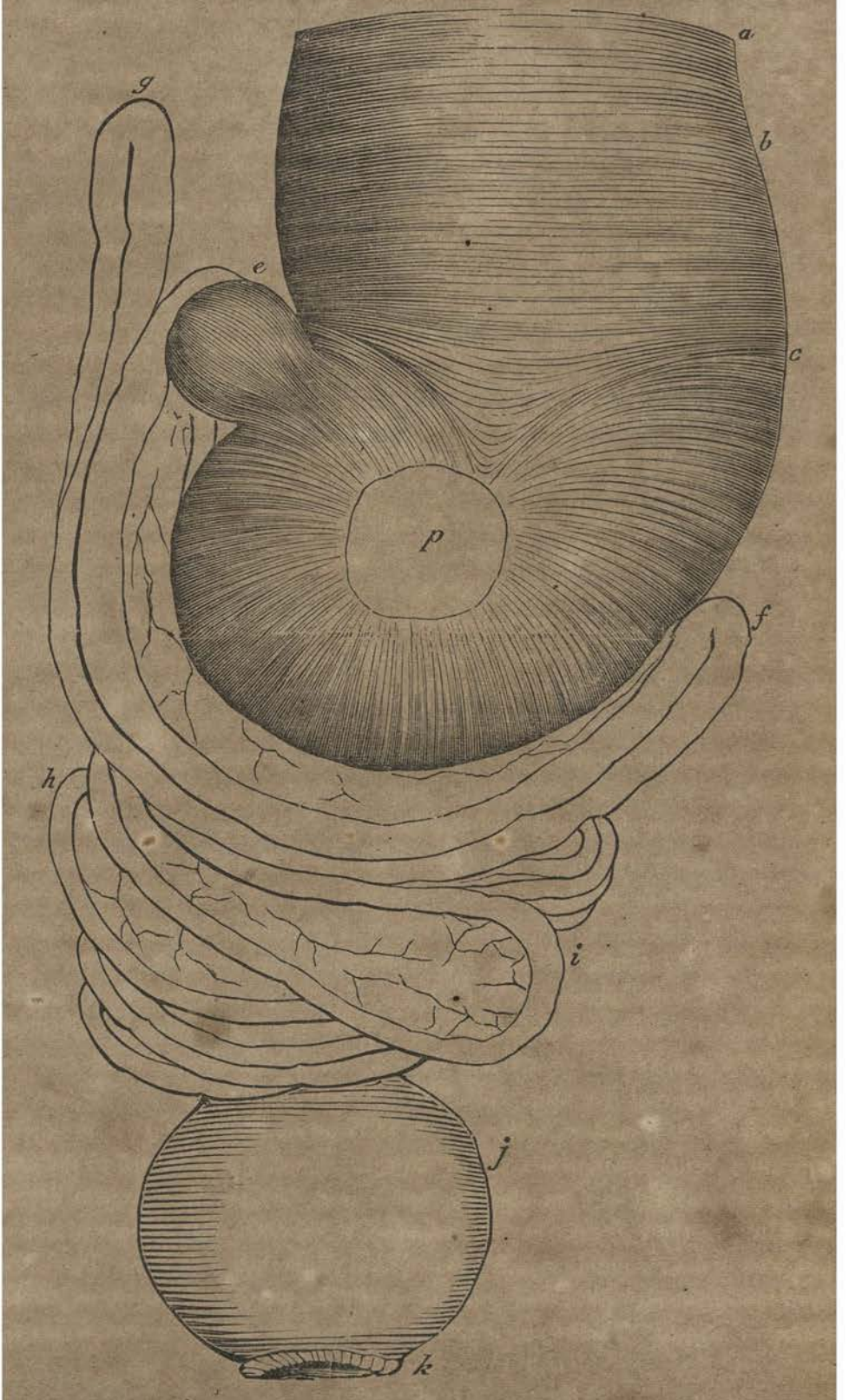
The young are at first covered with white down, and when fledged, are of the same colour. An individual just able to fly was of the following dimensions.

Length to end of tail 48½, to end of claws 56; wing from flexure 18; bill 5$\frac{4}{12}$; along the edge 7½; tarsus 6½; middle toe 4¼, its claw ⅝. The serrature of the middle claw is distinct at this age.

In this species, the skin is uncommonly tender, and of a yellow colour.

An adult male, received from Captain Napoleon Coste, of the United States Revenue Cutter "Campbell." The width of the mouth is 1¾ inches; but the lower mandible is capable of being dilated to 2½ inches, by means of an articulation on each side; the palate ascending, convex, with two longitudinal ridges, anteriorly with two papillate ridges, and a median ridge, which runs to the point of the mandible; the posterior aperture of the nares linear, 1¾ inches in length. Tongue 4¼ inches long, slender, tapering, trigonal, sagittate at the base, with a large pointed papilla on each side, flat above, with a median groove for half its length, afterwards convex, the tip acute. There is a large gular sac, although covered by feathers. The œsophagus is 2 feet 7 inches long, of great width in its whole extent, its diameter opposite the glottis being 2½ inches, in the other parts from 2 to 1¾. Its walls are very thin, but with the external muscular fibres distinct; the inner coat longitudinally plicate.

The heart is of moderate size, 1 inch 10 twelfths in length, 1½ in breadth. The aorta branches immediately in the usual manner, sending off to the left a common carotid and subclavian, which branches at the distance of 7¼ twelfths; to the right the same; and more to the same side, the carotid properly so called, which is smaller than either of the other vessels. The liver is of moderate size, its lobes very unequal, the left 2¼ inches, the right 8¾ inches in length. There is an enormous accumulation of fat in the omentum,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covering nearly the entire surface of the proventriculus and stomach, and extending under the intestine, being in one place 9 twelfths thick.

On entering the thorax the œsophagus immediately enlarges to 2½ inches, and gradually increases to 3, which is the greatest breadth of the proventriculus, *a b c*. The stomach, *c p e*, is a very large round sac, 3 inches in width, a little compressed, with roundish tendons, *p*, ¾ inch in diameter; its muscular coat extremely thin, and formed of very slender fasciculi; the inner coat soft and smooth. The proventricular glands form a complete belt, 1½ inches in breadth, at the upper part of which are numerous irregularly dispersed very large apertures of mucous crypts. The pyloric lobe of the stomach, *e*, is globular, 9 twelfths in diameter. The aperture of the pylorus 1½ twelfths in diameter, without valve. The intestine, *e f j k*, doubles in the usual manner, to form the duodenum, *e f g*, at the distance of 6 inches, then proceeds to the right lobe of the liver, bends backward, and is convoluted, with 18 turns, terminating in the rectum above the proventriculus; its length 7 feet 10 inches; the width of the duodenum 3½ twelfths, that of the rest of the intestine pretty uniformly 3 twelfths, a little narrowed towards the rectum, which is 5½ twelfths long, and at its commencement forms a single cœcum, ¼ inch long, and 3 twelfths in width. The average width of the rectum is 5 twelfths, and it terminates in a globular cloaca, *j k*, 1 inch 10 twelfths in diameter.

Trachea 22 inches long, considerably flattened, 5 twelfths in breadth at the upper part, 4¾ twelfths at the middle, and lastly contracting to 3½ twelfths. The rings cartilaginous, 270, the last 4 dimidiate. The right bronchus has 25 rings, the left 28; they are wide and compressed. There is a pair of cleido-tracheal muscles, passing from the thyroid bone to near the middle of the furcula. The lateral muscles are thin and slender at the upper part, at the lower part thicker and expanded over the whole surface before and behind; the anterior part gives off the sterno-tracheal, at the distance of 9 twelfths from the last ring, and the posterior part passes in the form of a compact slip, to the last half ring.

THE GREAT BLUE HERON.

ARDEA HERODIAS, *Linn.*

PLATE CCCLXIX.—MALE.

The State of Louisiana has always been my favourite portion of the Union, although Kentucky and some other States have divided my affections; but as we are on the banks of the fair Ohio, let us pause awhile, good reader, and watch the Heron. In my estimation, few of our waders are more interesting than the birds of this family. Their contours and movements are always graceful, if not elegant. Look on the one that stands near the margin of the pure stream:—see his reflection dipping as it were into the smooth water, the bottom of which it might reach had it not to contend with the numerous boughs of those magnificent trees. How calm, how silent, how grand is the scene! The tread of the tall bird himself no one hears, so carefully does he place his foot on the moist ground, cautiously suspending it for awhile at each step of his progress. Now his golden eye glances over the surrounding objects, in surveying which he takes advantage of the full stretch of his graceful neck. Satisfied that no danger is near, he lays his head on his shoulders, allows the feathers of his breast to droop, and patiently awaits the approach of his finned prey. You might imagine what you see to be the statue of a bird, so motionless is it. But now, he moves; he has taken a silent step, and with great care he advances; slowly does he raise his head from his shoulders, and now, what a sudden start! his formidable bill has transfixed a perch, which he beats to death on the ground. See with what difficulty he gulps it down his capacious throat! and now his broad wings open, and away he slowly flies to another station, or perhaps to avoid his unwelcome observers.

The "Blue Crane" (by which name this species is generally known in the United States) is met with in every part of the Union. Although more abundant in the low lands of our Atlantic coast, it is not uncommon in the countries west of the Alleghany Mountains. I have found it in every State in which I have travelled, as well as in all our "Territories." It is well known from Louisiana to Maine, but seldom occurs farther east than Prince Edward's Island in the Gulf of St. Lawrence, and not a Heron of any kind did I see or hear of in Newfoundland or Labrador. Westward, I believe, it reaches to the very bases of the Rocky Mountains. It is a hardy bird,

Great blue Heron.

Male.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. Lith.d Printed & Col.d by J.T. Bowen Phila.a

and bears the extremes of temperature surprisingly, being in its tribe what the Passenger Pigeon is in the family of Doves. During the coldest part of winter the Blue Heron is observed in the State of Massachusetts and in Maine, spending its time in search of prey about the warm springs and ponds which occur there in certain districts. They are not rare in the Middle States, but more plentiful to the west and south of Pennsylvania, which perhaps arises from the incessant war waged against them.

Extremely suspicious and shy, this bird is ever on the look-out. Its sight is as acute as that of any Falcon, and it can hear at a considerable distance, so that it is enabled to mark with precision the different objects it sees, and to judge with accuracy of the sounds which it hears. Unless under very favourable circumstances, it is almost hopeless to attempt to approach it. You may now and then surprise one feeding under the bank of a deep creek or bayou, or obtain a shot as he passes unawares over you on wing; but to walk up towards one would be a fruitless adventure. I have seen many so wary, that, on seeing a man at any distance within half a mile, they would take to wing; and the report of a gun forces one off his grounds from a distance at which you would think he could not be alarmed. When in close woods, however, and perched on a tree, they can be approached with a good chance of success.

The Blue Heron feeds at all hours of the day, as well as in the dark and dawn, and even under night, when the weather is clear, his appetite alone determining his actions in this respect; but I am certain that when disturbed during dark nights it feels bewildered, and alights as soon as possible. When passing from one part of the country to another at a distance, the case is different, and on such occasions they fly under night at a considerable height above the trees, continuing their movements in a regular manner.

The commencement of the breeding season varies, according to the latitude, from the beginning of March to the middle of June. In the Floridas it takes place about the first of these periods, in the Middle Districts about the 15th of May, and in Maine a month later. It is at the approach of this period only that these birds associate in pairs, they being generally quite solitary at all other times; nay, excepting during the breeding season, each individual seems to secure for itself a certain district as a feeding ground, giving chase to every intruder of its own species. At such times they also repose singly, for the most part roosting on trees, although sometimes taking their station on the ground, in the midst of a wide marsh, so that they may be secure from the approach of man. This unsocial temper probably arises from the desire of securing a certain abundance of food, of which each individual in fact requires a large quantity.

The manners of this Heron are exceedingly interesting at the approach

of the breeding season, when the males begin to look for partners. About sunrise you see a number arrive and alight either on the margin of a broad sand-bar or on a savannah. They come from different quarters, one after another, for several hours; and when you see forty or fifty before you, it is difficult for you to imagine that half the number could have resided in the same district. Yet in the Floridas I have seen hundreds thus collected in the course of a morning. They are now in their full beauty, and no young birds seem to be among them. The males walk about with an air of great dignity, bidding defiance to their rivals, and the females croak to invite the males to pay their addresses to them. The females utter their coaxing notes all at once, and as each male evinces an equal desire to please the object of his affection, he has to encounter the enmity of many an adversary, who, with little attention to politeness, opens his powerful bill, throws out his wings, and rushes with fury on his foe. Each attack is carefully guarded against, blows are exchanged for blows; one would think that a single well-aimed thrust might suffice to inflict death, but the strokes are parried with as much art as an expert swordsman would employ; and, although I have watched these birds for half an hour at a time as they fought on the ground, I never saw one killed on such an occasion; but I have often seen one felled and trampled upon, even after incubation had commenced. These combats over, the males and females leave the place in pairs. They are now mated for the season, at least I am inclined to think so, as I never saw them assemble twice on the same ground, and they become comparatively peaceable after pairing.

It is by no means a constant practice with this species to breed in communities, whether large or small; for although I have seen many such associations, I have also found many pairs breeding apart. Nor do they at all times make choice of the trees placed in the interior of a swamp, for I have found heronries in the pine-barrens of the Floridas, more than ten miles from any marsh, pond, or river. I have also observed nests on the tops of the tallest trees, while others were only a few feet above the ground; some also I have seen on the ground itself, and many on cactuses. In the Carolinas, where Herons of all sorts are extremely abundant, perhaps as much so as in the lower parts of Louisiana or the Floridas, on account of the numerous reservoirs connected with the rice plantations, and the still more numerous ditches which intersect the rice-fields, all of which contain fish of various sorts, these birds find it easy to procure food in great abundance. There the Blue Herons breed in considerable numbers, and if the place they have chosen be over a swamp, few situations can be conceived more likely to ensure their safety, for one seldom ventures into those dismal retreats at the

time when these birds breed, the effluvia being extremely injurious to health, besides the difficulties to be overcome in making one's way to them.

Imagine, if you can, an area of some hundred acres, overgrown with huge cypress trees, the trunks of which, rising to a height of perhaps fifty feet before they send off a branch, spring from the midst of the dark muddy waters. Their broad tops, placed close together with interlaced branches, seem intent on separating the heavens from the earth. Beneath their dark canopy scarcely a single sunbeam ever makes its way; the mire is covered with fallen logs, on which grow matted grasses and lichens, and the deeper parts with nympheæ and other aquatic plants. The congo snake and water-moccasin glide before you as they seek to elude your sight, hundreds of turtles drop, as if shot, from the floating trunks of the fallen trees, from which also the sullen alligator plunges into the dismal pool. The air is pregnant with pestilence, but alive with musquitoes and other insects. The croaking of the frogs, joined with the hoarse cries of the Anhingas and the screams of the Herons, forms fit music for such a scene. Standing knee-deep in the mire, you discharge your gun at one of the numerous birds that are breeding high over head, when immediately such a deafening noise arises, that, if you have a companion with you, it were quite useless to speak to him. The frightened birds cross each other confusedly in their flight; the young attempting to secure themselves, some of them lose their hold, and fall into the water with a splash; a shower of leaflets whirls downwards from the tree-tops, and you are glad to make your retreat from such a place. Should you wish to shoot Herons, you may stand, fire, and pick up your game as long as you please; you may obtain several species, too, for not only does the Great Blue Heron breed there, but the White, and sometimes the Night Heron, as well as the Anhinga, and to such places they return year after year, unless they have been cruelly disturbed.

The nest of the Blue Heron, in whatever situation it may be placed, is large and flat, externally composed of dry sticks, and matted with weeds and mosses to a considerable thickness. When the trees are large and convenient, you may see several nests on the same tree. The full complement of eggs which these birds lay is three, and in no instance have I found more. Indeed, this is constantly the case with all the large species with which I am acquainted, from *Ardea cærulea* to *Ardea occidentalis;* but the smaller species lay more as they diminish in size, the Louisiana Heron having frequently four, and the Green Heron five, and even sometimes six. Those of the Great Blue Heron are very small compared with the size of the bird, measuring only two and a half inches by one and seven-twelfths; they are of a dull bluish-white, without spots, rather rough, and of a regular oval form.

The male and the female sit alternately, receiving food from each other,

their mutual affection being as great as it is towards their young, which they provide for so abundantly, that it is not uncommon to find the nest containing a quantity of fish and other food, some fresh, and some in various stages of putrefaction. As the young advance they are less frequently fed, although still as copiously supplied whenever opportunity offers; but now and then I have observed them, when the nests were low, standing on their haunches, with their legs spread widely before them, and calling for food in vain. The quantity which they require is now so great that all the exertions of the old birds appear at times to be insufficient to satisfy their voracious appetite; and they do not provide for themselves until fully able to fly, when their parents chase them off, and force them to shift as they can. They are generally in good condition when they leave the nest; but from want of experience they find it difficult to procure as much food as they have been accustomed to, and soon become poor. Young birds from the nest afford tolerable eating; but the flesh of the old birds is by no means to my taste, nor so good as some epicures would have us to believe, and I would at any time prefer that of a Crow or young Eagle.

The principal food of the Great Blue Heron is fish of all kinds; but it also devours frogs, lizards, snakes, and birds, as well as small quadrupeds, such as shrews, meadow-mice, and young rats, all of which I have found in its stomach. Aquatic insects are equally welcome to it, and it is an expert fly-catcher, striking at moths, butterflies, and libellulæ, whether on the wing or when alighted. It destroys a great number of young Marsh-Hens, Rails, and other birds; but I never saw one catch a fiddler or a crab; and the only seeds that I have found in its stomach were those of the great water-lily of the Southern States. It always strikes its prey through the body, and as near the head as possible. When the animal is strong and active, it kills it by beating it against the ground or a rock, after which it swallows it entire. While on the St. John's river in East Florida, I shot one of these birds, and on opening it on board, found in its stomach a fine perch quite fresh, but of which the head had been cut off. The fish, when cooked, I found excellent, as did Lieutenant PIERCY and my assistant Mr. WARD. When on a visit to my friend JOHN BULOW, I was informed by him, that although he had several times imported gold fishes from New York, with the view of breeding them in a pond, through which ran a fine streamlet, and which was surrounded by a wall, they all disappeared in a few days after they were let loose. Suspecting the Heron to be the depredator, I desired him to watch the place carefully with a gun; which was done, and the result was, that he shot a superb specimen of the present species, in which was found the last gold fish that remained.

In the wild state it never, I believe, eats dead fish of any sort, or indeed

any other food than that killed by itself. Now and then it strikes at a fish so large and strong as to endanger its own life; and I once saw one on the Florida coast, that, after striking a fish, when standing in the water to the full length of its legs, was dragged along for several yards, now on the surface, and again beneath. When, after a severe struggle, the Heron disengaged itself, it appeared quite overcome, and stood still near the shore, his head turned from the sea, as if afraid to try another such experiment. The number of fishes, measuring five or six inches, which one of these birds devours in a day, is surprising. Some which I kept on board the Marion would swallow, in the space of half an hour, a bucketful of young mullets; and when fed on the flesh of green turtles, they would eat several pounds at a meal. I have no doubt that, in favourable circumstances, one of them could devour several hundreds of small fishes in a day. A Heron that was caught alive on one of the Florida keys, near Key West, looked so emaciated when it came on board, that I had it killed to discover the cause of its miserable condition. It was an adult female that had bred that spring; her belly was in a state of mortification, and on opening her, we found the head of a fish measuring several inches, which, in an undigested state, had lodged among the entrails of the poor bird. How long it had suffered could only be guessed, but this undoubtedly was the cause of the miserable state in which it was found.

I took a pair of Young Herons of this species to Charleston. They were nearly able to fly when caught, and were standing erect a few yards from the nest, in which lay a putrid one that seemed to have been trampled to death by the rest. They offered little resistance, but grunted with a rough uncouth voice. I had them placed in a large coop, containing four individuals of the *Ardea occidentalis*, who immediately attacked the newcomers in the most violent manner, so that I was obliged to turn them loose on the deck. I had frequently observed the great antipathy evinced by the majestic white species towards the blue in the wild state, but was surprised to find it equally strong in young birds which had never seen one, and were at that period smaller than the other. All my endeavours to remove their dislike were unavailing, for when placed in a large yard, the White Herons attacked the Blue, and kept them completely under. The latter became much tamer, and were more attached to each other. Whenever a piece of turtle was thrown to them, it was dexterously caught in the air and gobbled up in an instant, and as they became more familiar, they ate bits of biscuit, cheese, and even rinds of bacon.

When wounded, the Great Blue Heron immediately prepares for defence, and woe to the man or dog who incautiously comes within reach of its powerful bill, for that instant he is sure to receive a severe wound, and the

risk is so much the greater that birds of this species commonly aim at the eye. If beaten with a pole or long stick, they throw themselves on their back, cry aloud, and strike with their bill and claws with great force. I have shot some on trees, which, although quite dead, clung by their claws for a considerable time before they fell. I have also seen the Blue Heron giving chase to a Fish Hawk, whilst the latter was pursuing its way through the air towards a place where it could feed on the fish which it bore in its talons. The Heron soon overtook the Hawk, and at the very first lounge made by it, the latter dropped its quarry, when the Heron sailed slowly towards the ground, where it no doubt found the fish. On one occasion of this kind, the Hawk dropped the fish in the water, when the Heron, as if vexed that it was lost to him, continued to harass the Hawk, and forced it into the woods.

The flight of the Great Blue Heron is even, powerful, and capable of being protracted to a great distance. On rising from the ground or on leaving its perch, it goes off in silence with extended neck and dangling legs, for eight or ten yards, after which it draws back its neck, extends its feet in a straight line behind, and with easy and measured flappings continues its course, at times flying low over the marshes, and again, as if suspecting danger, at a considerable height over the land or the forest. It removes from one pond or creek, or even from one marsh to another, in a direct manner, deviating only on apprehending danger. When about to alight, it now and then sails in a circular direction, and when near the spot it extends its legs, and keeps its wings stretched out until it has effected a footing. The same method is employed when it alights on a tree, where, however, it does not appear to be as much at its ease as on the ground. When suddenly surprised by an enemy, it utters several loud discordant notes, and mutes the moment it flies off.

This species takes three years in attaining maturity, and even after that period it still increases in size and weight. When just hatched they have a very uncouth appearance, the legs and neck being very long, as well as the bill. By the end of a week the head and neck are sparingly covered with long tufts of silky down, of a dark grey colour, and the body exhibits young feathers, the quills large, with soft blue sheaths. The tibio-tarsal joints appear monstrous, and at this period the bones of the leg are so soft, that one may bend them to a considerable extent without breaking them. At the end of four weeks, the body and wings are well covered with feathers of a dark slate-colour, broadly margined with ferruginous, the latter colour shewing plainly on the thighs and the flexure of the wing; the bill has grown wonderfully, the legs would not now easily break, and the birds are able to stand erect on the nest or on the objects near it. They are now seldom fed

oftener than once a day, as if their parents were intent on teaching them that abstinence without which it would often be difficult for them to subsist in their after life. At the age of six or seven weeks they fly off, and at once go in search of food, each by itself.

In the following spring, at which time they have grown much, the elongated feathers of the breast and shoulders are seen, the males show the commencement of the pendant crest, and the top of the head has become white. None breed at this age, so far as I have been able to observe. The second spring, they have a handsome appearance, the upper parts have become light, the black and white marks are much purer, and some have the crest three or four inches in length. Some breed at this age. The third spring, the Great Blue Heron is as represented in the plate.

The males are somewhat larger than the females, but there is very little difference between the sexes in external appearance. This species moults in the Southern States about the beginning of May, or as soon as the young are hatched, and one month after the pendent crest is dropped, and much of the beauty of the bird is gone for the season. The weight of a full grown Heron of this kind, when it is in good condition, is about eight pounds; but this varies very much according to circumstances, and I have found some having all the appearance of old birds that did not exceed six pounds. The stomach consists of a long bag, thinly covered by a muscular coat, and is capable of containing several fishes at a time. The intestine is not thicker than the quill of a Swan, and measures from eight and a half to nine feet in length.

GREAT HERON, *Ardea Herodias*, Wils. Amer. Orn., vol. vii. p. 106.
ARDEA HERODIAS, Bonap. Syn., p. 304.
GREAT HERON, *Ardea Herodias*, Nutt. Man., vol. ii. p. 42.
GREAT BLUE HERON, *Ardea Herodias*, Aud. Orn. Biog., vol. iii. p. 87; vol. v. p. 599.

Male, 48, 72.

Resident from Texas to South Carolina. In spring migrates over the United States, and along the Atlantic coast to the Gulf of St. Lawrence Breeds everywhere. Retires southward in autumn. Common.

Adult Male in spring.

Bill much longer than the head, straight, compressed, tapering to a point, the mandibles nearly equal; upper mandible with the dorsal line nearly straight, the ridge broadly convex at the base, narrowed towards the end, a groove from the base to near the tip, beneath which the sides are convex, the edges extremely thin and sharp, towards the end broken into irregular serratures, the tip acute. Lower mandible with the angle extremely narrow and elongated, the dorsal line beyond it ascending, and slightly curved, the

ridge convex, the sides flattish and ascending, the edges as in the upper, the tip acuminate. Nostrils basal, linear, longitudinal, with a membrane above and behind.

Head of moderate size, oblong, compressed. Neck very long and slender. Body slender and compressed; wings large. Feet very long; tibia elongated, its lower half bare, very slender, covered all round with hexagonal scales; tarsus elongated, thicker than the lower part of the tibia, compressed, covered anteriorly with large scutella, excepting at the two extremities, where it is scaly, the sides and hind part with angular scales. Toes of moderate length, rather slender, scutellate above, reticularly granulate beneath, third toe much longer than second and fourth, which are nearly equal, first shorter, but strong; claws of moderate size, strong, compressed, arched, rather acute, the thin inner edge of that of the third toe finely serrated.

Space between the bill and eye, and around the latter, bare, as is the lower half of the tibia. Plumage soft, generally loose. Feathers of the upper part of the head long, tapering, decurved, two of them extremely elongated; of the back long and loose, of the rump soft and downy; scapulars with extremely long slender rather compact points. Feathers of the fore-neck much elongated and extremely slender, of the sides of the breast anteriorly very large, curved and loose; of the fore part of the breast narrower and elongated, as they are generally on the rest of the lower surface; on the tibia short. Wings large, rounded; primaries curved, strong, broad, tapering towards the end, the outer cut out on both margins, second and third longest; secondaries very large, broad and rounded, extending beyond the primaries when the wing is closed. Tail of moderate length, rounded, of twelve rather broad, rounded feathers.

Bill yellow, dusky-green above, loral and orbital spaces light green. Iris bright yellow. Feet olivaceous, paler above the tibio-tarsal joints; claws black. Forehead pure white; the rest of the elongated feathers bluish-black; throat white, neck pale purplish-brown, the elongated feathers beneath greyish-white, part of their inner webs purplish-blue. Upper parts in general light greyish-blue, the elongated tips of the scapulars greyish-white, the edge of the wing, some feathers at the base of the fore-neck, and the tibial feathers, brownish-orange. The two tufts of large curved feathers on the fore part of the breast bluish-black, some of them with a central stripe of white. Lower surface of the wings and the sides light greyish-blue; elongated feathers of the breast white, their inner edge black, of the abdomen chiefly black; lower tail-coverts white, some of them with an oblique mark of black near the tip.

Length to end of tail 48 inches, to end of claws 63 inches, extent of

wings 72; bill 5¼, gape 7$\frac{4}{12}$; tarsus 6½, middle toe and claw 5, hind toe and claw 2¼, naked part of tibia 4; wings from flexure 20; tail 7.

The Female, when in full plumage, is precisely similar to the male.

On Prince Edward's Island, in the Gulf of St. Lawrence, there is a fine breeding-place of the Great Blue Heron, which is probably the most northern on the Atlantic coast of North America. The birds there are more shy than they usually are at the period of breeding, and in the most cowardly manner abandon their young to the mercy of every intruder. A friend of mine who visited this place for the purpose of procuring adult birds in thei. best plumage, to add to his already extensive collection, found it extremely difficult to obtain his object, until he at length thought of covering himself with the hide of an ox, under the disguise of which he readily got within shot of the birds, which were completely deceived by the stratagem.

Adult Male. The interior of the mouth is similar to that of the last species, there being three longitudinal ridges on the upper mandible; its width is 1¼ inches, but the lower mandible can be dilated to 2¼ inches. The tongue is 3½ inches long, trigonal, and in all respects similar to that of *Ardea occidentalis*. The œsophagus is 24 inches in length, opposite the larynx its width is 2¾ inches, it then gradually contracts to the distance of 7 inches, becomes 1 inch 10 twelfths in width, and so continues until it enters the thorax, when it enlarges to 2 inches and so continues, but at the proventriculus is 2½ inches in breadth. The stomach is roundish, a little compressed, 2½ inches in diameter; its muscular coat thin, and composed of a single series of fasciculi, its inner coat soft and smooth, but with numerous irregular ridges. There is a roundish pyloric lobe, 9 twelfths in diameter. The proventricular glands form a belt 1 inch 4 twelfths in width; at its upper part are 10 longitudinal irregular series of very large mucous crypts; the right lobe of the liver is 3 inches in length, the left 2 inches; there is a gall-bladder of a curved form, 1¼ inches in length, and 6 twelfths in its greatest breadth. The intestine is 7 feet 7½ inches in length; its greatest width, in the duodenum, is 3½ twelfths, at the distance of 3 feet, it is 2¾ twelfths; a foot and a half farther on it is scarcely 2¼ twelfths; and half a foot from the rectum it is 2 twelfths; it then slightly enlarges. The rectum, including the cloaca, is 5 inches 9 twelfths in length; there is a single cœcum, 5 twelfths long, and 2½ twelfths in width, the average width of the rectum is ¼ inch, and it expands into a globular cloaca 2 inches 2 twelfths in diameter. The duodenum curves at the distance of 5 inches, then passes to the right lobe of the liver, bends backward, and is convoluted, forming 22 turns, terminating in the rectum above the stomach.

The trachea is 21 inches in length, from 4¼ twelfths to 3 twelfths in

breadth, toward the lower part enlarged to 4 twelfths, finally contracted to 3 twelfths. The rings are 252, with 4 terminal dimidiate rings. The right bronchus has 19, the left 20 half rings. The muscles are in all respects as in *Ardea occidentalis*.

GREAT AMERICAN WHITE EGRET.

ARDEA EGRETTA, *Gmel.*

PLATE CCCLXX.—MALE.

The truly elegant Heron which now comes to be described, is a constant resident in the Floridas; it migrates eastward sometimes as far as the State of Massachusetts, and up the Mississippi to the city of Natchez, and is never seen far inland, by which I mean that its rambles into the interior seldom extend to more than fifty miles from the sea-shore, unless along the course of our great rivers. On my way to Texas, in the spring of 1837, I found these birds in several places along the coast of the Gulf of Mexico, and on several of the islands scattered around that named Galveston, where, as well as in the Floridas, I was told that they spend the winter.

The Great American Egret breeds along the shores of the Gulf of Mexico, and our Atlantic States, from Galveston Island in Texas to the borders of the State of New York, beyond which, although stragglers have been seen, none, in so far as I can ascertain, have been known to breed. In all low districts that are marshy and covered with large trees, on the margins of ponds or lakes, the sides of bayous, or gloomy swamps covered with water, are the places to which it generally resorts during the period of reproduction; although I have in a few instances met with their nests on low trees, and on sandy islands at a short distance from the mainland. As early as December I have observed vast numbers congregated, as if for the purpose of making choice of partners, when the addresses of the males were paid in a very curious and to me interesting manner. Near the plantation of JOHN BULOW, Esq., in East Florida, I had the pleasure of witnessing this sort of tournament or dress-ball from a place of concealment not more than a hundred yards distant. The males, in strutting round the females, swelled their

Great American White Egret.

Male. Spring plumage

Drawn from Nature by J.J. Audubon F.R.S.F.L.S

Lith. & Col.d by Bowen & Co. Philada.

throats, as Cormorants do at times, emitted gurgling sounds, and raising their long plumes almost erect, paced majestically before the fair ones of their choice. Although these snowy beaux were a good deal irritated by jealousy, and conflicts now and then took place, the whole time I remained, much less fighting was exhibited than I had expected from what I had already seen in the case of the Great Blue Heron, *Ardea Herodias*. These meetings took place about ten o'clock in the morning, or after they had all enjoyed a good breakfast, and continued until nearly three in the afternoon, when, separating into flocks of eight or ten individuals, they flew off to search for food. These manœuvres were continued nearly a week, and I could with ease, from a considerable distance, mark the spot, which was a clear sand-bar, by the descent of the separate small flocks previous to their alighting there.

The flight of this species is in strength intermediate between that of *Ardea Herodias* and *A. rufescens*, and is well sustained. On foot its movements are as graceful as those of the Louisiana Heron, its steps measured, its long neck gracefully retracted and curved, and its silky train reminded one of the flowing robes of the noble ladies of Europe. The train of this Egret, like that of other species, makes its appearance a few weeks previous to the love season, continues to grow and increase in beauty, until incubation has commenced, after which period it deteriorates, and at length disappears about the time when the young birds leave the nest, when, were it not for the difference in size, it would be difficult to distinguish them from their parents. Should you, however, closely examine the upper plumage of an old bird of either sex, for both possess the train, you will discover that its feathers still exist, although shortened and deprived of most of their filaments. Similar feathers are seen in all other Herons that have a largely developed train in the breeding season. Even the few plumes hanging from the hind part of the *Ardea Herodias*, *A. Nycticorax*, and *A. violacea*, are subject to the same rule; and it is curious to see these ornaments becoming more or less apparent, according to the latitude in which these birds breed, their growth being completed in the southern part of Florida two months sooner than in our Middle Districts.

The American Egrets leave the Floridas almost simultaneously about the 1st of March, and soon afterwards reach Georgia and South Carolina, but rarely the State of New Jersey, before the middle of May. In these parts the young are able to fly by the 1st of August. On the Mule Keys off the coast of Florida, I have found the young well grown by the 8th of May; but in South Carolina they are rarely hatched until toward the end of that month or the beginning of June. In these more southern parts two broods are often raised in a season, but in the Jerseys there is, I believe, never more than one. While travelling, early in spring, between Savannah in Georgia

and Charleston in South Carolina, I saw many of these Egrets on the large rice plantations, and felt some surprise at finding them much wilder at that period of their migrations than after they have settled in some locality for the purpose of breeding. I have supposed this to be caused by the change of their *thoughts* on such occasions, and am of opinion that birds of all kinds become more careless of themselves; as the strength of their attachment toward their mates or progeny increases through the process of time, as is the case with the better part of our own species, lovers and parents performing acts of heroism, which individuals having no such attachment to each other would never dare to contemplate. In these birds the impulse of affection is so great, that when they have young they allow themselves to be approached, so as often to fall victims to the rapacity of man, who, boasting of reason and benevolence, ought at such a time to respect their devotion.

The American Egrets are much attached to their roosting places, to which they remove from their feeding grounds regularly about an hour before the last glimpse of day; and I cannot help expressing my disbelief in the vulgar notion of birds of this family usually feeding by night, as I have never observed them so doing even in countries where they were most abundant. Before sunset the Egrets and other Herons (excepting perhaps the Bitterns and Night Herons) leave their feeding grounds in small flocks, often composed of only a single family, and proceed on wing in the most direct course, at a moderate height, to some secure retreat more or less distant, according to the danger they may have to guard against. Flock after flock may be seen repairing from all quarters to these places of repose, which one may readily discover by observing their course.

Approach and watch them. Some hundreds have reached the well-known rendezvous. After a few gratulations you see them lower their bodies on the stems of the trees or bushes on which they have alighted, fold their necks, place their heads beneath the scapular feathers, and adjust themselves for repose. Daylight returns, and they are all in motion. The arrangement of their attire is not more neglected by them than by the most fashionable fops, but they spend less time at the toilet. Their rough notes are uttered more loudly than in the evening, and after a very short lapse of time they spread their snowy pinions, and move in different directions, to search for fiddlers, fish, insects of all sorts, small quadrupeds or birds, snails, and reptiles, all of which form the food of this species.

The nest of the Great White Egret, whether placed in a cypress one hundred and thirty feet high, or on a mangrove not six feet above the water, whether in one of those dismal swamps swarming with loathsome reptiles, or by the margin of the clear blue waters that bathe the Keys of Florida, is large, flat, and composed of sticks, often so loosely put together as to make

you wonder how it can hold, besides itself, the three young ones which this species and all the larger Herons have at a brood. In a few instances only have I found it compactly built, it being the first nest formed by its owners. It almost always overhangs the water, and is resorted to and repaired year after year by the same pair. The eggs, which are never more than three, measure two inches and a quarter in length, an inch and five-eighths in breadth, and when newly laid are smooth, and of a pale blue colour, but afterwards become roughish and faded. When the nest is placed on a tall tree, the young remain in it, or on its borders, until they are able to fly; but when on a low tree or bush, they leave it much sooner, being capable of moving along the branches without fear of being injured by falling, and knowing that should they slip into the water they can easily extricate themselves by striking with their legs until they reach either the shore or the nearest bush, by clinging to the stem of which they soon ascend to the top.

This Egret is shy and vigilant at all times, seldom allowing a person to come near unless during the breeding season. If in a rice-field of some extent, and at some distance from its margins, where cover can be obtained, you need not attempt to approach it; but if you are intent on procuring it, make for some tree, and desire your friend to start the bird. If you are well concealed, you may almost depend on obtaining one in a few minutes, for the Egrets will perhaps alight within twenty yards or less of you. Once, when I was very desirous of making a new drawing of this bird, my friend JOHN BACHMAN followed this method, and between us we carried home several superb specimens.

The long plumes of this bird being in request for ornamental purposes, they are shot in great numbers while sitting on their eggs, or soon after the appearance of the young. I know a person who, on offering a double-barrelled gun to a gentleman near Charleston, for one hundred White-Herons fresh killed, received that number and more the next day.

The Great Egret breeds in company with the Anhinga, the Great Blue Heron, and other birds of this family. The Turkey Buzzards and the Crows commit dreadful havoc among its young, as well as those of the other species. My friend JOHN BACHMAN gives me the following account of his visit to one of its breeding places, at the "Round O," a plantation about forty miles from Charleston: "Our company was composed of BENJAMIN LOGAN, S. LEE, and Dr. MARTIN. We were desirous of obtaining some of the Herons as specimens for stuffing, and the ladies were anxious to procure many of their primary feathers for the purpose of making fans. The trees were high, from a hundred to a hundred and thirty feet, and our shot was not of the right size; but we commenced firing at the birds, and soon discovered that we had a prospect of success. Each man took his tree, and

loaded and fired as fast as he could. Many of the birds lodged on the highest branches of the cypresses, others fell into the nest, and, in most cases, when shot from a limb, where they had been sitting, they clung to it for some time before they would let go. One thing surprised me: it was the length of time it took for a bird to fall from the place where it was shot, and it fell with a loud noise into the water. Many wounded birds fell some distance off, and we could not conveniently follow them on account of the heavy wading through the place. We brought home with us forty-six of the large White Herons, and three of the Great Blue. Many more might have been killed, but we became tired of shooting them."

ARDEA EGRETTA, Gmel. Syst. Nat., vol. i. p. 629.
GREAT WHITE HERON, *Ardea Egretta*, Wils. Amer. Orn., vol. vii. p. 106.
ARDEA ALBA, Bonap. Syn., p. 304.
ARDEA EGRETTA, Wagler, Syst. Av.
GREAT WHITE HERON, Nutt. Man., vol. ii. p. 47.
GREAT AMERICAN EGRET, *Ardea Egretta*, Aud. Orn. Biog., vol. iv. p. 600.

Male, 37, 57.

Resident in Florida, and Galveston Bay in Texas. Migrates in spring sometimes as far as Massachusetts; up the Mississippi to Natchez. Breeds in all intermediate districts. Returns south before winter. Very abundant.

Adult Male in summer.

Bill much longer than the head, straight, compressed, tapering to a point, the mandibles nearly equal. Upper mandible with the dorsal line nearly straight, the ridge broad and slightly convex at the base, narrowed and becoming rather acute towards the end, a groove from the base to two-thirds of the length, beneath which the sides are convex, the edges thin and sharp, with a notch close to the acute tip. Nostrils basal, linear, longitudinal, with a membrane above and behind. Lower mandible with the angle extremely narrow and elongated, the dorsal line beyond it ascending and almost straight, the edges sharp and direct, the tip acuminate.

Head small, oblong, compressed. Neck very long and slender. Body slender and compressed. Feet very long, tibia elongated, its lower half bare, slender, covered anteriorly and laterally with hexagonal scales, posteriorly with scutella; tarsus elongated, compressed, covered anteriorly with numerous scutella, some of which are divided laterally and posteriorly with angular scales. Toes of moderate length, rather slender, scutellate above, granulate beneath; third toe considerably longer than the fourth, which exceeds the second; the first large; the claws of moderate length, rather strong, arched, compressed, rather acute, that of the hind toe much larger, the inner edge of that of the third regularly pectinated.

Space between the bill and eye, and around the latter, bare. Plumage soft, blended; the feathers oblong, with their filaments generally disunited, unless on the wings and tail. There is no crest on the head, but the feathers on its upper and hind part are slightly elongated; those on the lower part of the neck anteriorly are elongated; and from between the scapulæ arises a tuft of extremely long, slightly decurved feathers, which extend about ten inches beyond the end of the tail, and have the shaft slightly undulated, the filaments long and distant. The wing is of moderate length; the primaries tapering but rounded, the second and third longest, the first slightly shorter than the fourth; the secondaries broad and rounded, some of the inner as long as the longest primaries, when the wing is closed. Tail very short, small, slightly rounded, of twelve rather weak feathers.

Bill bright yellow, as is the bare space between it and the eye; iris pale yellow; feet and claws black. The plumage is pure white.

Length to end of tail 37 inches, to end of claws 49, to end of wings 57¼, to carpus 23½, to end of dorsal plumes 57; bill along the ridge $4\frac{7}{12}$, along the edge of lower mandible $5\frac{5}{12}$; wing from flexure 16½; tail 6¼; extent of wings 55; bare part of tibia 3½; tarsus $6\frac{1}{12}$; hind toe 1½, its claw $1\frac{2}{12}$; second toe $2\frac{8}{12}$, its claw $\frac{7}{12}$; third toe $3\frac{1}{12}$, its claw $\frac{9}{12}$; fourth toe $3\frac{2}{12}$, its claw $\frac{1}{12}$. Weight 2¼ lbs.

The Female is similar to the male, but somewhat smaller.

The roof of the mouth is slightly concave, with a median and two lateral longitudinal ridges, the palate convex, the posterior aperture of the nares linear, without an anterior slit. The mouth is rather narrow, measuring only 8 twelfths across, but is dilatable to 1½ inches, the branches of the lower mandible being very elastic. The aperture of the ear is very small, being 2 twelfths in diameter, and roundish. The œsophagus is 2 feet 2 inches long, 1 inch and 4 twelfths in diameter, extremely thin, the longitudinal fibres within the transverse, the inner coat raised into numerous longitudinal ridges. The œsophagus continues of uniform diameter, and passes as it were directly into the stomach, there being no enlargement at its termination indicative of the proventriculus, which however exists, but in a modified form, there being at the termination of the gullet eight longitudinal series of large mucous crypts, about half an inch long, and immediately afterwards a continuous belt, 1½ inches in breadth, of small cylindrical mucous crypts with minute apertures. Beyond this the stomach forms a hemispherical sac 1½ inches in diameter, of a membranous structure, having externally beneath the cellular coat a layer of slender muscular fibres, convex towards two roundish tendons, and internally a soft, thin, smooth lining, perforated by innumerable minute apertures of glandules. The

intestine is very long and extremely slender, measuring 6 feet 7 inches in length, its average diameter 2 twelfths. The rectum, *b d f*, is 3 inches long; the cloaca, *d e f*, globular, 1½ inches in diameter; the cœcum, *c*, single, as in the other Herons, 3 twelfths long, and nearly 2 twelfths in diameter.

The trachea is 1 foot 9¾ inches long, of nearly uniform diameter, flattened a little for about half its length, its greatest breadth 3½ twelfths; the rings 285, the last four rings divided and arched. The contractor muscles are extremely thin, the sterno-tracheal moderate, and coming off at the distance of 1 inch from the lower extremity, from which place also there proceeds to the two last rings a pair of slender inferior laryngeal muscles. The bronchi are very short, of about two half rings.

TAPAYAXIN.

The animal represented on the plate is the *Tapayaxin* of HERNANDEZ, *Phrynosoma orbicularis* of WIEGMANN, *Tapaya orbicularis* of CUVIER. The specimen from which it was drawn was entrusted to my care by my friend RICHARD HARLAN, M. D., to whom it was presented by Mr. NUTTALL, who found it in California. A notice respecting this species by Dr. HARLAN will be found in the American Journal of Science and Arts, vol. xxxi.

Reddish Egret

THE REDDISH EGRET.

ARDEA RUFESCENS, *Gmel.*

PLATE CCCLXXI.—ADULT AND YOUNG.

While sailing towards the Florida Keys, my mind was agitated with anticipations of the delight I should experience in exploring a region whose productions were very imperfectly known. Often did I think of the Heron named after TITIAN PEALE, by my learned friend the Prince of MUSIGNANO. Mr. PEALE had procured only a single specimen, and in the winter season, but whether or not the species was abundant on the Keys of Florida remained to be discovered. No sooner had I been landed and formed an acquaintance with Mr. EAGAN the pilot, who was well acquainted with the haunts of many of the birds of those islands, than I asked him respecting the various Herons which might be found there or on the shores of the mainland. Before answering me, he counted his fingers slowly, and then said that he could recollect only "twelve sorts;" "but," added he, "these birds change their colour so curiously, that it is past wonder with me to believe that any one man could know them without watching them as I have done for many years." I then inquired if I was in good time to procure all the sorts which he knew. He answered in the affirmative; but felt some doubt as to my procuring the eggs of one kind at least, which breed earlier than the rest, and was pure white from the shell, and the largest of all. Thinking the species to which he alluded might be the *Ardea alba* of LINNÆUS, I asked if it had long thread-like feathers over the tail during the breeding season. "Oh no, Sir," said he, "it never has; it is as tall as yourself, and when you see some on the wing, you will be pleased, for their wings are as large as those of the Brown Pelican. The one I guess you mean, mostly goes farther to the eastward to breed, along with a very small one, also always white, with the feathers over the tail as you say, and curled upwards. These are the only three sorts that are white." I begged him to describe the colours of the others, which he did so well that I recognised ten species in all; but the large white one, and another of a grey and purple colour, were unknown to me, and I told him so, stating at the same time how anxious I was to procure them if possible. "If possible! nothing in the world can be more easy, for if they have no eggs left, they have young

ones enough to load your schooner. I can take you straight to their breeding-place."

You may suppose, reader, how my spirits were raised by this intelligence, and how surprised I was that PEALE'S Egret was not in the number of the Florida Herons. We speedily embarked in Mr. THURSTON'S boat, spread our sails to the breeze, and passed several keys, on which we procured two young birds of the large white species, which I saw at once was unknown to me. As we approached the next island, I saw twenty or thirty pairs of Herons, some of which were pure white, others of a light blue colour, but so much larger than the Blue Heron, *Ardea cœrulea*, that I asked the pilot what they were, when he answered, "the very fellows I want to shew you, and you may soon see them close enough, as you and I will shoot a few by way of amusement." Before half an hour had elapsed, more than a dozen were lying at my feet. Some of them were as white as driven snow, the rest of a delicate purplish tint, inclining to grey on the back and wings, with heads and necks of a curious reddish colour. Males and females there were, but they were all of one species, for my companion assured me that "this sort bred before they turned to their natural colours," by which he meant before attaining their full plumage at the age of three years. Well, the immature birds were the very same as the individual to which, as the representative of a new species, the name of Peale's Egret had been given. This I saw at once, for so good is the representation of it in the fourth volume of BONAPARTE'S American Ornithology, that from the mere recollection of it I was enabled to recognise the bird at once. You may imagine the pleasure I felt, as well as that which I experienced on becoming better acquainted with this species, which I found in many places both with eggs and with young.

The Reddish Egret is a constant resident on the Florida Keys, to which it is so partial at all seasons that it never leaves them. Some individuals are seen as far east as Cape Florida, and westward along the Gulf of Mexico. Whether it may ever betake itself to fresh water I cannot say, but I never found one in such a situation. It is a more plump bird for its size than most other Herons, and in this respect resembles the Night Heron and the Yellow-crowned species, but possesses all the gracefulness of the tribe to which it belongs. In walking it lifts its feet high, and proceeds at a quiet pace, but sometimes briskly; it alights with ease on trees, and walks well on the larger branches. It rarely feeds from the edges of the water, but resorts to the shallows of the extensive mud or sand flats, so numerous about the keys. There, twenty or thirty, sometimes as many as a hundred, may be seen wading up to the heel (or knee-joint as it is usually called) in pursuit of prey, or standing in silence awaiting the approach of an animal on which it

feeds, when it strikes it, and immediately swallows it, if not too large; but if so, it carries it to the shore, beats it, and tears it to pieces, rarely, however, using its feet for that purpose, and certainly never employing its pectinated claws, which no Heron that I know of ever uses for any other object than that of scratching its head, or perhaps of securing its steps on rocky bottoms. These birds remain on the flats thus employed, until the advance of the tide forces them to the land.

The flight of this Heron is more elevated and regular than that of the smaller species. During the love season, it is peculiarly graceful and elegant, especially when one unmated male is pursuing another, a female being in sight. They pass through the air with celerity, turn and cut about in curious curves and zigzags, the stronger bird frequently erecting its beautiful crest, and uttering its note, at the moment when it expects to give its rival a thrust. When these aerial combats take place between old and immature birds, their different colours form a striking contrast, extremely pleasing to the beholder. While travelling to and from their feeding grounds, or from one key to another, they propel themselves by easy, well-sustained, and regular flappings of their extended wings, the neck reposing on the shoulders, the legs stretched out behind like a rudder, while their beautiful thready trains float in the breeze. On approaching a landing-place, they seldom fail to perform a few circumvolutions, in order to see that all around is quiet, for they are more shy and wary than the smaller Herons, and almost as suspicious as the two larger species, *Ardea occidentalis*, and *A. Herodias;* and this becomes apparent as soon as they discontinue the feeding of their young, when you find it extremely difficult to approach them. After this period I rarely shot one, unless I happened to come upon it unawares, or while it was passing over me when among the mangroves.

About the beginning of April, these Herons begin to pair. The males chase each other on the ground, as well as in the air, and on returning to their chosen females erect their crest and plumes, swell out their necks, pass and repass before them, and emit hollow rough sounds, which it is impossible for me to describe. It is curious to see a party of twenty or thirty on a sand-bar, presenting as they do a mixture of colours from pure white to the full hues of the old birds of either sex; and still more curious perhaps it is to see a purple male paying his addresses to a white female, while at hand a white male is caressing a purple female, and not far off are a pair of white, and another of purple birds. Nay, reader, until I had witnessed these remarkable circumstances, I felt some distrust respecting the statement of the worthy pilot. I am even now doubtful if all the young breed the first spring after their birth, and am more inclined to think that they do not, on account of the large flocks of white birds of this species which during the

breeding time kept apart from those that had nests, but which on examination were not found to be barren birds, although they had the crests and pendent feathers less elongated than those white individuals that were actually breeding.

By the middle of April, they construct their nests, which they place for the most part on the south-western sides of the mangroves immediately bordering the keys, never on the trees at a distance from the water, and rarely very close together. Some are placed on the top branches, others a foot or two above the highest tide-mark; many of them are annually repaired, perhaps all that stand the winter gales. The nest, which is quite flat, is large for the size of the bird, and is formed of dry sticks, interspersed with grass and leaves. The eggs are three, average an inch and three quarters in length, one and three-eighths in breadth, have an elliptical form, and a smooth shell, of a uniform rather pale sea-green colour. They afford excellent eating. Both sexes incubate, but I did not ascertain the time required for hatching.

The young while yet naked are of a dark colour, there being only a few scanty tufts of long soft down on the head and other parts; but when the feathers begin to sprout they become white. Being abundantly and carefully fed, at first by regurgitation, they grow fast, and soon become noisy. When about a month old, they are fed less frequently, and the fish is merely dropt before them, or into their open throats; soon after they sit upright on the nest, with their legs extended forward, or crawl about on the branches, as all other Herons are wont to do. They are now sensible of danger, and when a boat is heard coming towards them they hide among the branches, making towards the interior of the keys, where it is extremely difficult to follow them. On one occasion, when I was desirous of procuring some of them alive, to take to Charleston, it took more than an hour to catch eight or nine of them, for they moved so fast and stealthily through the mangroves, always making for the closest and most tangled parts, that a man was obliged to keep his eyes constantly on a single individual, which it was very difficult to do, on account of the number of birds crossing each other in every direction. They do not fly until they are six or seven weeks old, and even then do not venture beyond the island on which they have been reared. In captivity, those which we had procured fed freely, and soon became tolerably docile. They were supplied with pieces of green turtle and other species of the tribe, and some of them reached Charleston in good health. One continued alive for nearly two years with my friend the Rev. JOHN BACHMAN. It was allowed to walk in the garden and poultry-yard, and ate an enormous quantity of small fish and all sorts of garbage, contenting itself, when better food was scarce, with the entrails of fowls, and even fed freely

on moistened corn-meal or mush. It caught insects with great dexterity, and was very gentle and familiar, frequently going into the kitchen, where it was a great favourite. It had acquired a crest and a few of the pendent feathers of the back by the month of January, when about twenty-two months old. One cold night it was accidentally neglected, and in the morning was found dead, having shared the fate of so many thousands of pet birds in all parts of the world. On being opened, it was found to be a male. Although I have not been able to trace the gradual changes of colour which this species undergoes, I have little doubt that it will be found to attain maturity the third spring after birth.

The Reddish Egret rarely associates with others; nor does it suffer them to nestle on the same island with itself. In this respect, it differs from all other Herons with which I am acquainted; for although the Great White Heron, *A. occidentalis*, has a decided antipathy to the Great Blue Heron, still it now and then allows a few to breed on the north side of its island. The present species is as strictly marine as the Great White Heron; and these are the only two that are so, for all the others feed on fresh-water fishes, not less than on those obtained in salt-water, as well as on other food of various kinds. Like all others, the Reddish Egret loses its ornaments soon after incubation, when old and young mix, and follow their occupations together. When wounded, it strikes with its bill, scratches with its claws, and, throwing itself on its back, emits its rough and harsh notes, keeping all the while its crest erected and expanded, and its feathers swelled out. Its principal food consists of fishes of various sizes, of which it consumes a great number, and of which it finds no difficulty in procuring a sufficiency, as all the waters of those portions of the Floridas that are inhabited by it are very profusely stocked. I was told that, although still plentiful in the Floridas, this species was much more so when the keys were first settled. I was present when a person killed twenty-eight in succession in about an hour, the poor birds hovering above their island in dismay, and unaware of the destructive power of their enemy.

The remarkable circumstance of this bird's changing from white to purple, will no doubt have some tendency to disconcert the systematists, who, it seems, pronounce all the birds which they name Egrets to be always white; but how much more disconcerted must they be when they see that among the Herons peculiarly so named, which they say are always coloured, the largest known to exist in the United States is pure white. It is not at present my intention to say what an Egret is, or what a Heron is; but it can no longer be denied that the presence or absence of a loose crest, floating plume, and a white colour, are insufficient for establishing essential characters separating Egrets from Herons, which in fact display the most intimate connec-

tion, the one group running into the other in an almost imperceptible gradation. Hoping that an account of the extent of the migrations of the species of Heron that occur in the United States, and whose habits I have studied for many years under the most favourable circumstances, may prove acceptable, I now lay one before you, arranging the species according to size, without regard to the rank they hold in systematic works.

1. The Great White Heron. *Ardea occidentalis.* A constant resident on the southern keys of Florida; entirely maritime; never goes farther eastward than Cape Florida, though in winter the younger birds migrate southward, and perhaps pass beyond the extremities of the Gulf of Mexico.

2. The Great Blue Heron. *Ardea Herodias.* A constant resident in the Floridas; migrates throughout the Union, and as far along the Atlantic coast as the southernmost islands of the Gulf of St. Lawrence in summer; breeds in all the districts, and at the approach of winter returns to the Southern States.

3. The White Heron. *Ardea Egretta.* Resident in the Floridas; migrates to the eastward sometimes as far as Massachusetts, and up the Mississippi as far as the city of Natchez; never seen far inland.

4. The Reddish Egret. *Ardea rufescens.* Resident on the Florida Keys; entirely maritime; never seen farther eastward than Cape Florida; the young sometimes remove southward in winter.

5. The American Bittern. *Ardea lentiginosa.* A winter resident in the Floridas; many migrate over the greater part of the Union and beyond its northern limits; never seen in Kentucky; return before winter to the Southern States.

6. The Night Heron. *Ardea Nycticorax.* Resident in the Floridas; migrates eastward as far as Maine, up the Mississippi as high as Memphis; none seen in Kentucky; returns to the Southern States at the approach of winter, and occurs at the distance of a hundred miles inland.

7. The Yellow-crowned Heron. *Ardea violacea.* A few spend the winter in the Floridas; it rarely migrates farther eastward than New Jersey; proceeds up the Mississippi to Natchez; never goes far inland; the greatest number winter beyond the southern limits of the United States.

8. The Blue Heron. *Ardea cærulea.* Resident in the Floridas; migrates eastward as far as Long Island; proceeds up the Mississippi about a hundred miles above Natchez; never goes far inland.

9. The Louisiana Heron. *Ardea Ludoviciana.* Resident in the Floridas; rarely seen as far east as New Jersey; seldom passes Natchez on the Mississippi; never goes far inland.

10. The White Egret. *Ardea candidissima.* Resident in the Floridas; migrates eastward as far as New York, up the Mississippi as far as Memphis;

never goes far inland; returns to the Southern States as soon as the young are able to travel.

11. The Green Heron. *Ardea virescens.* Resident in the Floridas; disperses over the Union; goes far inland; the greater number return at the approach of winter to the Southern States.

12. The Least Bittern. *Ardea exilis.* Resident in the Floridas; migrates as far as Maine, and throughout the Western Country, far up the Missouri; returns early in autumn to the Southern States.

You will see from the above statement, that the Herons are almost similar to our Pigeons in respect to the extent of their migrations, which must appear the more remarkable on account of their comparative size, *Ardea Herodias* and *A. virescens* corresponding in a great degree to the *Columba migratoria* and *C. carolinensis.*

Ardea rufescens, Gmel. Syst. Nat., vol. i. p. 628.
Peale's Egret Heron, *Ardea Pealii*, Bonap. Amer. Orn., vol. iv. p. 96. Young.
Peale's Egret, Nutt. Man., vol. ii. p. 49. Young.
Reddish Egret, *Ardea rufescens*, Aud. Orn. Biog., vol. iii. p. 411; vol. v. p. 604.

Male, 31, 46.

Resident on the Florida Keys, and in Galveston Bay. Never seen inland. Extremely abundant.

Adult Male.

Bill much longer than the head, straight, compressed, tapering, the mandibles nearly equal in size. Upper mandible with the dorsal line nearly straight, the ridge broad and convex at the base, afterwards very narrow, a groove from the base to near the end, beneath which the sides are convex, the edges thin and sharp, with a notch on each side close to the narrow but obtuse tip. Nostrils basal, linear, longitudinal. Lower mandible with the angle long and extremely narrow, the dorsal line beyond it ascending and very slightly convex, the edges sharp and slightly inflected, the tip very narrow but obtuse.

Head rather small, oblong, compressed. Neck very long and slender. Body slender and compressed. Feet very long; tibia elongated and slender, its lower half bare, covered all round with angular scales; tarsus elongated, slender, compressed, covered anteriorly with numerous large scutella, laterally and behind with angular scales. Toes of moderate length, rather slender, scutella above, reticularly granulate beneath; third toe considerably longer than the fourth, which is in nearly the same proportion longer than the second, the first much shorter, but strong; claws rather small, strong, arched, compressed, obtuse, that of hind toe much larger, the inner edge of that of the third regularly pectinated.

Space between the bill and eye, and around the latter, bare, as is the lower half of the tibia. Plumage soft, generally loose. Feathers of the upper and hind part of the head, and of the neck generally, especially on the sides and at the lower part anteriorly, much elongated, very narrow, loose, with linear compact extremities. The feathers of the back are similar but broader at their base, and those from the middle of the back are so elongated as to extend several inches beyond the tail, forming a train of which the filaments are hair-like and rather stiff. Wings of moderate length; primaries broad, tapering, the inner broadly rounded, with an acumen, as are the very broad secondaries; first quill longest, second almost equal, third and fourth slightly shorter, the rest of the primaries rapidly graduated; the inner secondaries extend to nearly an inch of the tip of the wing, when the latter is closed. Tail very short, slightly rounded, of twelve rather weak rounded feathers.

Bill black on its terminal third, the rest and the bare space on the head pale flesh-colour. Iris white. Legs and feet ultramarine blue, the scutella bluish-black, as are the claws. Feathers of the head and neck light reddish-brown, tinged with lilac, the tips fading to brownish-white. Back and wings dull greyish-blue; the long feathers of the train yellowish towards the tips; all the lower parts are greyish-blue, paler than that of the upper.

Length to end of tail 31 inches, to end of wings 32; to end of claws 40; extent of wings 46; wing from flexure 14½; tail 4½; bill along the back 4, along the edge of lower mandible 4½, depth at the base 1; bare part of tibia 4½; tarsus 6; middle toe 3, its claw ⅝. Weight 1¾ lbs.

The Female is precisely similar to the male in colour, but is rather smaller.

Young nearly two years old.

The bill is coloured as in the adult, as is the iris, but the feet are dark olive-green, the soles greenish-yellow. The plumage presents the same form as in the adult, but is entirely pure white.

In this state the bird has been described as a distinct species under the name of Peale's Egret Heron, but must now be restored to its proper species, the adult having been described and figured by BUFFON under the name of *Aigrette rousse*, and named by LATHAM the Reddish Egret.

This species may be distinguished at the first glance from all others that occur in the United States, by the peculiar form of the feathers of the head and neck, which are loose, pendent, and fringe-like, at all seasons, excepting in the young bird before the first moult.

The number of young, as in all other species, much exceeds that of adult or coloured birds; and I have procured them in the proportion of three to one. I carried upwards of fifty specimens of this Heron to Charleston, where, as well as in Philadelphia, New York, and London, I presented some to my friends and to public institutions. I also sent several to my friend

P. J. SELBY, Esq. of Twizel, Northumberland, and lately gave a pair to the Museum of the University of Edinburgh. Several specimens, which I presented to His Royal Highness the DUKE of SUSSEX, have been by him given to the British Museum.

In this species a long series of elongated feathers commences at the lower fourth of the neck, on each side above, the intervening space being bare for the breadth of ½ inch; they pass directly down along the back, terminating on the scapulæ, at the distance of ½ inch from its extremity, gradually becoming more elongated, the first being 1 inch 8 twelfths in length, the last 14 inches. These feathers occupy a ridge ½ inch in breadth at its lower part, and ought more peculiarly to be named scapulars, for the feathers so called, which are also elongated and tapering, run across the head of the humerus, close to its articulation. These series are terminated by four large and broad feathers of the ordinary texture. The elongated feathers on the fore part of the neck also form two similar series on each side.

The mouth is as in the preceding species, its width 10 twelfths; the lower mandible dilatable to 1 inch 5 twelfths; the tongue very small, 1 inch 7 twelfths in length, tapering to a fine point, but flattened, and very thin. Œsophagus 18 inches long, 2 inches wide at the commencement, 1½ at the distance of 3 inches, after that uniformly 1 inch; on entering the thorax it enlarges to 1 inch 3 twelfths; and between it and the stomach is a contraction, the breadth of which is 9 twelfths. The stomach is very small, of an irregular roundish form, 1 inch in diameter, compressed; its tendons 8 twelfths in breadth; the pyloric lobe 9 twelfths in length, 7 twelfths in width, being much more elongated than in the other species. The proventricular glands are very small, and form a complete belt 1½ inches in breadth. The inner surface of the stomach is soft and irregularly rugous, as in the other species; that of the pyloric lobe quite smooth. Right lobe of the liver 2 inches 2 twelfths in length, left 2 inches; gall-bladder oblong, 1½ inches long, and 5 twelfths in breadth. Intestine 6 feet long, forming 26 folds; duodenum 2½ twelfths wide; the smallest diameter 1 twelfth; rectum 4½ inches long; its width 3 twelfths; cloaca globular, 1½ inches in diameter; cœcum 2 twelfths long, and of the same width.

Trachea 13 inches long, its breadth uniformly 3 twelfths. It is considerably flattened, which is not the case with the other species. The rings 180, and 4 dimidiate. Bronchial half rings 20 and 18. The muscles as in the other species.

BLUE HERON.

ARDEA CŒRULEA, *Linn.*

PLATE CCCLXXII.—ADULT MALE AND YOUNG.

Along with a few other Herons, this is, comparatively speaking, confined within narrow limits along our southern coast in winter. It occurs, however, in most parts of the Floridas, where it is a constant resident, and whence, at the approach of summer, vast multitudes are seen proceeding northward, in search of suitable places in which they may rear their young in security. Many, however, go southward, beyond the limits of the United States, and proceed coastwise to Texas and Mexico to spend the winter, especially the younger birds, when still in that singular white plumage which differs so much from that of the young of every other known species of this genus, except that of the Reddish Egret (*A. rufescens*). At New Orleans, where it arrives at the same period, both from Mexico and the Floridas, its first appearance in spring is about the beginning of March; at which time also multitudes leave the Floridas on their way eastward, to settle in Georgia, the Carolinas, and other States farther east, as far as Long Island in that of New York. Beyond this, I believe, no birds of the species have been met with. They rarely, if ever, proceed far inland, or leave the shores of our large rivers and estuaries. On the Mississippi, the swamps and lakes on the borders of which are so well adapted to the habits of these birds, few individuals are ever seen above Natchez. About the beginning of September, by which time the young are able to shift for themselves, they return southward.

When in the Floridas, during winter, I observed that the Blue Herons associated with other species, particularly the White Heron, *Ardea Egretta*, and the Louisiana Heron, *Ardea Ludoviciana*, all of which were in the habit of roosting together in the thick evergreen low bushes that cover the central parts of the islands along the coast. Their passage to and from their feeding places, is as regular as the rising and setting of the sun, and, unless frequently disturbed, they betake themselves every night to the same locality, and almost to the same spot. In the morning, they rise with one accord from the roosts on which they have been standing all night on one leg, the other drawn up among the feathers of the abdomen, their neck retracted,

Blue Heron

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

1. Male adult Spring Plumage 2. Young second Year

Lith.d Printed & Col.d by J. T. Bowen Phila.a

and their head and bill buried beneath their scapulars. On emerging from their retreats, they at once proceed to some distant place in search of food, and spend the day principally on the head waters of the rivers, and the fresh-water lakes of the interior, giving a decided preference to the soft mud banks, where small crabs or fiddlers are abundant, on which they feed greedily, when the inland ponds have been dried up, and consequently no longer supply them with such fishes as they are wont to feed upon.

There, and at this season, reader, you may see this graceful Heron, quietly and in silence walking along the margins of the water, with an elegance and grace which can never fail to please you. Each regularly-timed step is lightly measured, while the keen eye of the bird seeks for and watches the equally cautious movements of the objects towards which it advances with all imaginable care. When at a proper distance, it darts forth its bill with astonishing celerity, to pierce and secure its prey; and this it does with so much precision, that, while watching some at a distance with a glass, I rarely observed an instance of failure. If fish is plentiful, on the shallows near the shore, when it has caught one, it immediately swallows it, and runs briskly through the water, striking here and there, and thus capturing several in succession. Two or three dashes of this sort, afford sufficient nourishment for several hours, and when the bird has obtained enough it retires to some quiet place, and remains there in an attitude of repose until its hunger returns. During this period of rest, however, it is as watchful as ever, and on hearing the least noise, or perceiving the slightest appearance of danger, spreads its wings, and flies off to some other place, sometimes to a very distant one. About an hour before sunset, they are again seen anxiously searching for food. When at length satisfied, they rise simultaneously from all parts of the marsh, or shore, arrange themselves into loose bodies, and ascending to the height of fifty or sixty yards in the air, fly in a straight course towards their roosting-place. I saw very few of these birds during the winter, on or near the river St. John in Florida; but on several occasions met with some on small ponds in the pine barrens, at a considerable distance from any large stream, whither they had been attracted by the great number of frogs.

The flight of the Blue Heron is rather swifter than that of the Egret, *Ardea candidissima*, and considerably more so than that of the Great Blue Heron, *Ardea Herodias*, but very similar to that of the Louisiana Heron, *Ardea Ludoviciana*. When the bird is travelling, the motion is performed by flappings in quick succession, which rapidly propel it in a direct line until it is about to alight, when it descends in circular sailings of considerable extent towards the spot selected. During strong adverse winds, they fly low, and in a continuous line, passing at the necessary distance from the

shores to avoid danger, whether at an early or a late hour of the day. I recollect that once, on such an occasion, when, on the 15th of March, I was in company with my friend JOHN BACHMAN, I saw a large flock about sunset arising from across the river, and circling over a large pond, eight miles distant from Charleston. So cautious were they, that although the flock was composed of several hundred individuals, we could not manage to get so much as a chance of killing one. I have been surprised to see how soon the Blue Herons become shy after reaching the districts to which they remove for the purpose of breeding from their great rendezvous the Floridas, where I never experienced any difficulty in procuring as many as I wished. In Louisiana, on the other hand, I have found them equally vigilant on their first arrival. On several occasions, when I had placed myself under cover, to shoot at some, while on their way to their roosts or to their feeding grounds, I found it necessary to shift from one place to another, for if one of them had been fired at and had fallen in a particular place, all that were in its company took care not to pass again near it, but when coming up diverged several hundred yards, and increased their speed until past, when they would assume their more leisurely flappings. In South Carolina, where they are very shy on their arrival, I have seen them fly off on hearing the very distant report of a gun, and alight on the tops of the tallest trees, where they would congregate in hundreds, and whence they would again fly off on the least apprehension of danger. But when once these Herons have chosen a place to nestle in, or reached one in which they bred the preceding year, they become so tame as to allow you to shoot as many as you are disposed to have.

While on Cayo Island, in the Gulf of Mexico, on the 10th of April, 1837, I observed large flocks of the Blue and Green Herons, *Ardea cœrulea* and *A. virescens*, arriving from the westward about the middle of the day. They flew at a considerable height, and came down like so many Hawks, to alight on the low bushes growing around the sequestered ponds, and this without any other noise than the rustling of their wings as they glided through the air towards the spot on which they at once alighted. There they remained until sunset, when they all flew off, so that none were seen there next day. This shews that although these species migrate both by day and night, they are quite diurnal during the period of their residence in any section of the country which they may have chosen for a season. It is more than probable that it has been from want of personal knowledge of the habits of these birds, that authors have asserted that all Herons are nocturnally inclined. This certainly is by no means the case, although they find it advantageous to travel by night during their migrations, which is a remarkable circumstance as opposed to their ordinary habits. In the

instance above mentioned, I found the birds remarkably gentle, which was probably owing to fatigue.

The Blue Heron breeds earlier or later, according to the temperature of the district to which it resorts for that purpose, and therefore earlier in Florida, where considerable numbers remain, during the whole year, than in other parts of the United States. Thus I have found them in the southern parts of that country, sitting on their eggs, on the 1st of March, fully a month earlier than in the vicinity of Bayou Sara, on the Mississippi, where they are as much in advance of those which betake themselves, in very small numbers indeed, to our Middle Districts, in which they rarely begin to breed before the fifteenth of May.

The situations which they choose for their nests are exceedingly varied. I have found them sitting on their eggs on the Florida Keys, and on the islands in the Bay of Galveston, in Texas, in nests placed amidst and upon the most tangled cactuses, so abundant on those curious isles, on the latter of which the climbing rattlesnake often gorges itself with the eggs of this and other species of Heron, as well as with their unfledged young. In the lower parts of Louisiana, it breeds on low bushes of the water-willow, as it also does in South Carolina; whereas, on the islands on the coast of New Jersey, and even on the mainland of that State, it places its nest on the branches of the cedar and other suitable trees. Wherever you find its breeding place, you may expect to see other birds in company with it, for like all other species, excepting perhaps the Louisiana Heron, it rarely objects to admit into its society the Night Heron, the Yellow-crowned Heron, or the White Egret.

The heronries of the southern portions of the United States are often of such extraordinary size as to astonish the passing traveller. I confess that I myself might have been as sceptical on this point as some who, having been accustomed to find in all places the Heron to be a solitary bird, cannot be prevailed on to believe the contrary, had I not seen with my own eyes the vast multitudes of individuals of different species breeding together in peace in certain favourable localities.

The nest of the Blue Heron, wherever situated, is loosely formed of dry sticks, sometimes intermixed with green leaves of various trees, and with grass or moss, according as these materials happen to be plentiful in the neighbourhood. It is nearly flat, and can scarcely be said to have a regular lining. Sometimes you see a solitary nest fixed on a cactus, a bush, or a tree; but a little beyond this you may observe from six to ten, placed almost as closely together as you would have put them had you measured out the space necessary for containing them. Some are seen low over the water,

while others are placed high; for, like the rest of its tribe, this species is rather fond of placing its tenement over or near the liquid element.

The eggs are usually three, rarely four; and I have never found a nest of this species containing five eggs, as is stated by WILSON, who probably found a nest of the Green Heron containing that number among others of the present species. They measure an inch and three quarters in length, by an inch and a quarter in breadth, being about the size of those of *Ardea candidissima*, though rather more elongated, and precisely of the same colour.

The young bird is at first almost destitute of feathers; but scantily covered with yellowish-white down. When fully fledged, its bill and legs are greenish-black, and its plumage pure white, or slightly tinged with cream-colour, the tips of the three outer primaries light greyish-blue. Of this colour the bird remains until the breeding season, when, however, some individuals exhibit a few straggling pale blue feathers. When they have entered on their second year, these young birds become spotted with deeper blue on some parts of the body, or on the head and neck, thus appearing singularly patched with that colour and pure white, the former increasing with the age of the bird in so remarkable a manner, that you may see specimens of these birds with portions even of the pendent feathers of their head or shoulders so marked. And these are produced by *full moultings*, by which I mean the unexpected appearance, as it were, of feathers growing out of the skin of the bird coloured entirely blue, as is the case in many of our land birds. In all these stages of plumage, and from the first spring after birth, the young birds breed with others, as is equally the case with *Ardea rufescens*. You may see a pure white individual paired with one of a full blue colour, or with one patched with blue and white. The young, after leaving their parents, remain separate from the old birds until the next breeding season. At no period can the young of this species be confounded with, or mistaken for that of the *Ardea candidissima*, by a person really acquainted with these birds, for the Blue Heron is not only larger than the latter, but the very colour of its feet and legs is perfectly distinctive. Indeed, during the time when the young Blue Heron is quite white (excepting on the tips of the outer primaries) it would be easier to confound it with the young of the Reddish Egret, *Ardea rufescens*, than with that of any other, were the feathers of its hind head and neck of the same curious curled appearance as those of that species.

My friend JOHN BACHMAN informs me, that in South Carolina, this species not unfrequently breeds in the company of the Louisiana Heron, the nests and eggs of which, he adds, are very similar. He has specimens of these birds in all the different stages which I have described. At New Or-

leans, the Blue Herons, during the transition of their plumage from white to blue, are called "Egrettes folles," or foolish Egrets, on account of their unusual tameness. My friend BACHMAN and I, shot, on the 6th and 9th of April, several specimens spotted with blue feathers, and having their crests and trains similarly mixed, although of full length; but in most of the specimens obtained, the white was still prevalent. I have shot some in Louisiana, in autumn, in the same curious dress.

This species, though larger than the Snowy Heron, *Ardea candidissima*, is considerably inferior to it in courage; and I was much amused as well as surprised, when at Galveston Bay, on the 24th of April, 1837, to see one of that species alight near a Purple Heron, attack it, and pursue it as far as I could follow them with my eyes. When the Blue Herons are on the sea-coast they not unfrequently repose on the large mud or sand bars, at some distance from the adjacent marshes; but they generally prefer roosting on trees or bushes, when there are any in their neighbourhood. The Creoles of Louisiana not unfrequently eat the flesh of this species, and although they by no means consider it equal to that of the Night Heron, some of them have assured me that it is not bad food. Like other birds of this family, they become larger with age, and the male is usually somewhat superior in size to the female; but, with this exception, no difference can be perceived in the external appearance of the sexes.

BLUE HERON, *Ardea cœrulea*, Wils. Amer. Orn., vol. vii. p. 117.
ARDEA CŒRULEA, Bonap. Syn., p. 300.
BLUE HERON, Nutt. Man., vol. ii. p. 58.
BLUE HERON, *Ardea cœrulea*, Aud. Orn. Biog., vol. iv. p. 58.

Male, 24½, 42.

Resident in Florida and Texas, where it breeds. In spring migrates as far as Long Island; up the Mississippi to a hundred miles above Natchez. Never seen far inland.

Adult Male in full plumage.

Bill much longer than the head, rather slender, very slightly decurved, compressed, tapering to a point. Upper mandible with the dorsal line nearly straight for two-thirds of its length, then slightly decurved, the ridge convex, broad at the base, gradually narrowed to the point; a groove from the base to near the end, the sides convex beneath, the edges thin and sharp, with a slight notch close to the tips. Nostrils basal, linear, longitudinal, with a membrane above and behind. Lower mandible with the angle extremely narrow and elongated, the dorsal line beyond it ascending and almost straight, the sides sloping outwards, and flattened, the edges sharp and slightly inflected, the tip acuminate.

Head rather small, oblong, compressed. Neck very long and slender. Body slender and compressed. Feet very long; tibia elongated, its lower half bare, very slender, covered all round with angular scales, of which the posterior are large; tarsus elongated, slender, compressed, anteriorly covered with numerous broad scutella, laterally and behind with angular scales. Toes long, slender, with numerous broad scutella above, flattened and reticularly granulate beneath. Claws rather long, arched, compressed, acute, that of hind toe much larger and more curved, the inner edge of that of the third finely and regularly pectinate.

Space between the bill and eye, and around the latter, bare. Plumage soft, thin, and blended. Feathers of the upper and hind part of the head very long, linear, with loose barbs; of the sides of the neck loose and inclined obliquely backwards, of its lower part much elongated, narrow, and tapering to a point; of the middle of the back extremely long, linear, acuminate, their tips projecting about five inches beyond the tail. Wings long, and very broad; primaries broad, tapering, and rounded, the first, second and third almost equal, the latter being only a twelfth of an inch longer, secondaries broad and rounded; some of the inner only half an inch shorter than the longest primary, when the wing is closed. Tail very short, small, even, of twelve rather weak feathers.

Bill ultramarine blue at the base, gradually shaded into black towards the point; the bare space between it and the eye, as well as the edges of the eyelids, ultramarine. Iris pale yellow. Legs, tarsi, toes, and claws, black. Head and neck of a rich deep purple, inclining to vinaceous; the lower part of the neck and all the other parts deep greyish-blue, the edges of the feathers lighter.

Length to end of tail 24½ inches, to end of wings 25, to end of elongated dorsal feathers 26½, to end of claws 30¾; wing from flexure 11½; tail $4\frac{5}{12}$; extent of wings 42; bill along the ridge $3\frac{4}{12}$, along the edge of lower mandible 4; bare part of tibia $2\frac{2}{12}$; tarsus $3\frac{5}{12}$; first toe $\frac{11}{12}$, its claw $\frac{9}{12}$; middle toe 2¼, its claw $\frac{7}{12}$. Weight 1 lb.

The Female is similar to the male, but smaller. Weight 11 oz.

The young are at first sparely covered with yellowish-white down. When a fortnight old, the bill is yellow, with the tips greenish-black; the feet greenish-yellow, the claws dusky, with the tips greyish-yellow. The general colour of the plumage is pure white, but the down which tips the feathers of the head is brownish-white; two of the alular feathers are tinged with dull bluish-grey, and the outer seven or eight primaries are broadly margined on both sides to the length of about an inch and a half, with the same colour of a deeper tint, the extreme tip white.

When fully fledged, the bare parts at the base of the bill, and the basal

half of the upper mandible, are light greenish-blue, the rest black; the lower mandible yellow, with a patch of black an inch and a quarter in length on each side at the end. Legs, tarsi, and toes greenish-blue, the sides yellowish; claws dusky. The feathers of the head are slightly elongated; those of the back are also elongated, but much broader and shorter than in the adult. The feathers on the upper part of the head are of a faint bluish-grey; and the alular feathers and eight outer primaries are tinged with the same colour. At this period, the length to the end of the tail is 22 inches, to end of claws 28½; bill along the ridge 2⅞; wing from flexure 11; tail 4$\frac{3}{12}$.

In November, when the moult is advanced. The bill is black, dull blue at the base. The feet are nearly black, as are the claws. The occipital feathers are now two inches and a half in length, and some of the dorsal feathers extend as far as the tips of the wings; those of the lower part of the neck have also a length of about three inches. The general colour of the plumage is white; the upper part of the head, the hind neck, back, anterior edge of the wing, and outer primaries at the end, of a faint bluish-grey tint; some of the elongated feathers of the back darker.

Length to end of tail 22 inches; to end of claws 29½; bill 3; wing from flexure 11¼.

A year old. Bill nearly as in the adult; feet bluish-black, the plumage is white, with the upper parts pale greyish-blue as in November, but the whole interspersed with numerous feathers of a deep greyish-blue, similar to that of the adult; the primaries and tail being still white.

Length to end of tail 23¼; extent of wings 32½; bill 3½. Weight 9 oz.

At the age of a year the bird propagates, so that individuals in the white, mottled, or blue plumage, may be seen breeding together.

When only a few weeks old, the serrature of the claw of the middle toe is scarcely perceptible, exhibiting merely faint indications of points upon a very slight margin. This margin enlarges, and when the bird is completely fledged the serratures are perfectly formed.

In this bird, as in most other Herons, the crura of the lower mandible are thin, flexible, and elastic, the angle filled by an elastic membrane covered by the skin. The tongue is 1 inch long, sagittate at the base, tapering to a point. The roof of the mouth has a median prominent ridge, and two lateral lines; the palate is convex; the posterior aperture of the nares 10 lines in length. The pharynx may be dilated to 1½ inches; the œsophagus, which is 12 inches long, is, when dilated, 10 lines in diameter at its upper part, and gradually contracts to 7 lines; at the curvature of the neck it lies directly behind, having passed down on the left side, along with the trachea. Its walls are extremely thin, contrasting in this respect with the œsophagus of the Great Northern Diver and other swimming piscivorous birds. The

proventriculus is 1 inch long, its glandules cylindrical, and extremely slender. The stomach seems as if it merely formed a basal sac to the œsophagus, its muscles being extremely thin, its tendons circular and half an inch in diameter; cuticular lining soft. The intestine is long and very narrow, 5 feet 10 inches in length, 2 lines in diameter at the upper part, 1½ near the rectum, which is 2¾ inches long, with a diameter of 4½ lines, and terminates in a nipple-like cœcum, projecting 3 lines beyond the entrance of the small intestine, but having no appearance of the two lateral appendages usually called cœca. In this respect, the Blue Heron agrees with others of the same family. The cloaca is about an inch in length and breadth.

The trachea, when extended, is 8¾ inches long. The rings 170 in number, are osseous and circular, so that the organ preserves its cylindrical form under all circumstances. They are, like those of all Herons, of equal breadth on both sides, not broad on one side and narrow on the other, as has been represented. The contractor muscles are very slender, as are the sterno-tracheal; the former send down a slip on each side to the first bronchial ring. The diameter of the trachea is 2 lines at the upper part, 1½ at the lower. The bronchi are short, wide, conical, of about 13 half rings.

The right lobe of the liver is 2¾ inches long, the left lobe 1½; the heart 1¼ in length, 8 lines broad, of an oblong conical form. The stomach contained remains of insects and crustaceous animals, together with a few seeds.

LOUISIANA HERON.

ARDEA LUDOVICIANA, *Wils.*

PLATE CCCLXXIII.—MALE.

Delicate in form, beautiful in plumage, and graceful in its movements, I never see this interesting Heron, without calling it the Lady of the Waters. Watch its motions, as it leisurely walks over the pure sand beaches of the coast of Florida, arrayed in the full beauty of its spring plumage. Its pendent crest exhibits its glossy tints, its train falls gracefully over a well defined tail, and the tempered hues of its back and wings contrast with those of its lower parts. Its measured steps are so light that they leave no

N°73.
Pl. 373
Louisiana Heron
Male Adult
Drawn from Nature by J.J. Audubon F.R.S.E.L.S.
Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

impression on the sand, and with its keen eye it views every object around with the most perfect accuracy. See, it has spied a small fly lurking on a blade of grass, it silently runs a few steps, and with the sharp point of its bill it has already secured the prey. The minnow just escaped from the pursuit of some larger fish has almost rushed upon the beach for safety; but the quick eye of the Heron has observed its motions, and in an instant it is swallowed alive. Among the herbage yet dripping with dew the beautiful bird picks its steps. Not a snail can escape its keen search, and as it moves around the muddy pool, it secures each water lizard that occurs. Now the sun's rays have dried up the dews, the flowers begin to droop, the woodland choristers have ended their morning concert, and like them, the Heron, fatigued with its exertions, seeks a place of repose under the boughs of the nearest bush, where it may in safety await the coolness of the evening. Then for a short while it again searches for food. Little difficulty does it experience in this; and at length, with the last glimpse of day, it opens its wings, and flies off towards its well-known roosting place, where it spends the night contented and happy.

This species, which is a constant resident in the southern parts of the peninsula of the Floridas, seldom rambles far from its haunts during the winter season, being rarely seen at that period beyond Savannah in Georgia to the eastward. To the west it extends to the broad sedgy flats bordering the mouths of the Mississippi, along the whole Gulf of Mexico and perhaps much farther south. In the beginning of spring, it is found abundantly in the Carolinas, and sometimes as far east as Maryland, or up the Mississippi as high as Natchez. You never find it far inland: perhaps forty miles would be a considerable distance at any time of the year. It is at all seasons a social bird, moving about in company with the Blue Heron or the White Egret. It also frequently associates with the larger species, and breeds in the same places, along with the White Heron, the Yellow-crowned Heron, and the Night Heron; but more generally it resorts to particular spots for this purpose, keeping by itself, and assembling in great numbers. Those which visit the Carolinas, or the country of the Mississippi, make their appearance there about the first of April, or when the Egrets and other species of Heron seek the same parts, returning to the Floridas or farther south about the middle of September, although I have known some to remain there during mild winters. When this is the case, all the other species may be met with in the same places, as the Louisiana Heron is the most delicate in constitution of all. Whilst at St. Augustine in Florida, in the month of January, I found this species extremely abundant there; but after a hard frost of a few days, they all disappeared, leaving the other Herons, none of which seemed to be affected by the cold, and returned

again as soon as the Fahrenheit thermometer rose to 80°. There they were in full livery by the end of February, and near Charleston by the 5th of April.

Although timid, they are less shy than most other species, and more easily procured. I have frequently seen one alight at the distance of a few yards, and gaze on me as if endeavouring to discover my intentions. This apparent insensibility to danger has given rise to the appellation of *Egrette folle*, which is given to them in Lower Louisiana.

The flight of this beautiful Heron is light, rather irregular, swifter than that of any other species, and capable of being considerably protracted. They usually move in long files, rather widely separated, and in an undulating manner, with constant flappings. When proceeding towards their roosts, or when on their migrations, they pass as high over the country as other species; on the former occasion, they pass and repass over the same track, thus enabling the gunner easily to shoot them, which he may especially calculate on doing at the approach of night, when they are gorged with food, and fly lower than in the morning. They may, however, be still more surely obtained on their arriving at their roosting place, where they alight at once among the lower branches. On being shot at, they seldom fly to a great distance, and their attachment to a particular place is such that you are sure to find them there during the whole period of their stay in the country, excepting the breeding time. At the cry of a wounded one, they assail you in the manner of some Gulls and Terns, and may be shot in great numbers by any person fond of such sport.

On the 29th of April, while wading around a beautiful key of the Floridas, in search of certain crustaceous animals called the sea cray-fish, my party and I suddenly came upon one of the breeding places of the Louisiana Heron. The southern exposures of this lovely island were overgrown with low trees and bushes matted together by thousands of smilaxes and other creeping plants, supported by various species of cactus. Among the branches some hundred pairs of these lovely birds had placed their nests, which were so low and so close to each other, that without moving a step one could put his hand into several. The birds thus taken by surprise rose affrighted into the air, bitterly complaining of being disturbed in their secluded retreat. The nests were formed of small dried sticks crossing each other in various ways. They were flat, had little lining, and each containing three eggs, all the birds being then incubating. Observing that many eggs had been destroyed by the Crows and Buzzards, as the shells were scattered on the ground, I concluded that many of the Herons had laid more than once to make up their full complement of eggs; for my opinion is, that all our species, excepting the Green Heron, never lay more nor less than three,

unless an accident should happen. The eggs of the Louisiana Heron measure one inch and six and a half twelfths in length, an inch and a quarter in breadth; they are nearly elliptical, of a beautiful pale blue colour inclining to green, smooth, and with a very thin shell. The period of incubation is twenty-one days. Like all other species of the genus, this raises only one brood in the season. The little island of which I have spoken lies exposed to the sea, and has an extent of only a few acres. The trees or bushes with which it was covered seemed to have been stunted by the effect produced by their having been for years the receptacles of the Heron's nests.

On the 19th of May, in the same year, I found another breeding place of this species not far from Key West. The young birds, which stood on all the branches of the trees and bushes on the southern side of the place, were about the size of our Little Partridge. Their notes, by which we had been attracted to the spot, were extremely plaintive, and resembled the syllables *wiee, wiee, wiee.* When we went up to them, the old birds all flew to another key, as if intent on drawing us there; but in vain, for we took with us a good number of their young. It was surprising to see the little fellows moving about among the branches, clinging to them in all sorts of curious positions, and persevering in forcing their way toward the water, when over which they at once dropped, and swam off from us with great vigour and speed. When seized with the hand, they defended themselves to the utmost. At this early period, they plainly shewed the sprouting feathers of the crest. Many Crow Blackbirds had nests on the same mangroves, and a Fish-Hawk also had formed its nest there at a height of not more than five feet from the water. On the 24th of May, these Herons were fully fledged, and able to fly to a short distance. In this state we, with some difficulty, procured one alive. Its legs and feet were green, the bill black, but its eyes, like those of an adult bird, were of a beautiful red hue. Many were caught afterwards and taken as passengers on board the Marion. They fed on any garbage thrown to them by the sailors; but whenever another species came near them, they leaped towards its bill, caught hold of it as if it had been a fish, and hung to it until shaken off by their stronger associates. On several occasions, however, the *Ardea occidentalis* shook them off violently, and after beating them on the deck, swallowed them before they could be rescued!

The place farthest up on the Mississippi where I have found this species breeding was on Buffalo creek, about forty miles below Natchez, and ten miles in a direct line from the great river. To the eastward I have found them breeding in company with the Green Heron and the Night Heron, within a few miles of Charleston.

During summer and autumn, after the old birds have left their young, both

are frequently seen in the rice-fields, feeding along the ditches by which the water is led to those places. At this season they are uncommonly gentle and easily approached.

The Louisiana Heron acquires the full beauty of its plumage the second year after its birth, although it continues for some time to increase in size. The train and crest lengthen for several years until they become as represented in the plate. To procure specimens in such complete plumage, however, requires some care, for this state does not last many days after pairing has taken place, and by the time the young are hatched much of this fine plumage has dropped. When autumn has come, only a few of the long barbs remain, and in winter no appearance of them can be seen.

The flesh of the young birds affords tolerable eating. The food of this species consists of small fry, water insects, worms, slugs, and snails, as well as leeches, tadpoles, and aquatic lizards.

Louisiana Heron, *Ardea Ludoviciana*, Wils. Amer. Orn., vol. viii. p. 13.
Ardea Ludoviciana, Bonap. Syn., p. 305.
Louisiana Heron, Nutt. Man., vol. ii. p. 51.
Louisiana Heron, *Ardea Ludoviciana*, Aud. Orn. Biog., vol. iii. p. 136; vol. v. p. 605.

Male, 27, 37.

Resident in the Floridas and Texas, where it is abundant. Migrates eastward to New Jersey, where it is rare; up the Mississippi to Natchez. Never seen far inland.

Adult Male.

Bill much longer than the head, straight, compressed, tapering to a point, the mandibles nearly equal. Upper mandible with the dorsal line nearly straight, the ridge broad and slightly convex at the base, narrowed towards the end, a groove from the base to two-thirds of the length, beneath which the sides are convex, the edges thin and sharp, with a notch on each side close to the sharp tip. Nostrils basal, linear, longitudinal, with a membrane above and behind. Lower mandible with the angle extremely narrow and elongated, the dorsal line beyond it ascending and almost straight, the edges sharp and slightly inflected, the tip acuminate.

Head rather small, oblong, compressed. Neck very long and slender. Body slender and compressed; wings rather large. Feet very long; tibia elongated, its lower half bare, very slender, covered all round with angular scales, of which the posterior are scutelliform; tarsus elongated, slender, compressed, covered anteriorly with numerous scutella, laterally and behind with angular scales. Toes of moderate length, rather slender, scutellate above, reticularly granulate beneath; third toe much longer than second, which is very little longer than fourth, the hind toe much shorter but strong;

claws of moderate size, rather strong, arched, compressed, rather acute, that of the hind toe much larger, the edge of that of the third regularly pectinated.

Space between the bill and eye, and around the latter, bare, as is the lower half of the tibia. Plumage soft, generally loose. Feathers of the upper and hind part of the head elongated, tapering, decurved, about six of them larger and much longer; of the sides, and especially of the lower part of the neck, also much elongated and narrow. The feathers of the fore part of the back long and narrow-pointed, those behind extremely elongated, with long loose thread-like barbs; the rest of the back with short soft feathers. Wing of moderate length; primaries tapering but rounded, the third longest, second very little shorter, first and fourth about equal; secondaries broad and rounded, some of the inner as long as the longest primaries, when the wing is closed. Tail very short, small, slightly rounded, of twelve rather weak feathers.

Bill brownish-black on the greater part of the upper mandible, and on the sides of the lower mandible towards the point; the rest yellow, as is the bare space before and around the eye. Iris bright red. Feet light yellowish-green, the anterior scutella dusky, as are the claws. The general colour of the upper parts is light purplish-blue; the elongated feathers of the head and hind neck above of a fine reddish-purple, as are those of the lower part of the neck; the six longest feathers of the head white. The long loose feathers of the back dull purplish-yellow, paler towards their extremities. Throat white, its lower part chestnut; a line of white all the way down the fore part of the neck; the longer feathers of the fore part of the breast dusky-blue on their inner webs. The breast, abdomen, tibiæ, and under wing-coverts, white; the lower tail-coverts tipped with blue.

Length to end of tail 27 inches, to end of wings 28, to end of claws 34½; extent of wings 37; loose feathers from 4 to 5 inches beyond the tail; wing from flexure 10¾; tail 3½; bill along the back 4, along the edges 5; bare part of tibia 2¼; tarsus 4⅛, middle toe 2½, its claw ½. Weight 1 lb.

The Adult Female is precisely similar to the male.

The Young, when newly hatched, are covered above with pale purplish-grey down, which is of greater length on the head, as in other species.

The young fully fledged have the neck and fore part of the back light brownish-red, the throat and lower parts white, as is the hind part of the back; the quills, larger wing-coverts and tail, light purplish-blue. The feathers of the head, neck and back are not yet elongated. The bill nearly as in the adult, but the legs deep-greenish-olive.

After the first moult, the feathers of the head, neck and back, are a little elongated, and begin to be tinged with the colours which they have when

the bird is full grown. The red of the neck is changed for tints of blue and purple, as is that of the back, although remnants of it are still seen. The fore part of the neck is white, mixed with brownish-red; the legs lighter.

Male from Galveston Island. In all the Herons that are furnished with elongated feathers on the fore part of the back, these feathers form part of a series on each side, arranged in the line of the scapulæ, and extending to the middle of the neck above. In all the Herons also, when the neck is curved, the œsophagus and trachea pass above the line of the vertebræ at its lower part on the right side. The mouth is in this as in the other species, its width 8 twelfths, the lower mandible dilatable to 1 inch 1 twelfth. Tongue 1 inch 1 twelfth long, flattened, thin; grooved above, tapering to a point. Œsophagus 16 inches long, at its commencement 1¼ inches in width, soon after contracting to 10 twelfths, and so continuing until it enters the thorax, where it enlarges to 1 inch. The right lobe of the liver is 1 inch 11 twelfths in length, the left lobe 1¼ inches; the gall-bladder 8 twelfths long, 3 twelfths in breadth. The proventricular glands form a belt 10 twelfths in breadth. The stomach is small, only 1 inch in diameter, its muscular coat rather thick, the tendons roundish, half an inch in breadth; the pyloric lobe 7½ twelfths long, 4 twelfths in diameter; the inner surface of the stomach as in the preceding species. The intestine forms 30 folds, and measures 4 feet 7 inches in length; its greatest width scarcely greater than that of a crow quill, being only 1 twelfth in the duodenal part, and almost precisely uniform in its whole length. The rectum is 3½ inches long, 3 twelfths in width; the cœcum 3 twelfths long, 1½ twelfths wide; the cloaca globular, 1 inch 2 twelfths in diameter.

Trachea 12½ inches long, of the uniform breadth of 2 twelfths, moderately flattened. The rings firm, 218, and 4 dimidiate. Bronchial half rings 20 and 18. Muscles as in the other species.

Snowy Heron.

Drawn from Nature by J. J. Audubon, F.R.S.E.L.S. *Male* Lith. & Col.d by Bowen & Co., Philada.

THE SNOWY HERON

ARDEA CANDIDISSIMA, *Gmel.*

PLATE CCCLXXIV.—MALE.

This beautiful species is a constant resident in Florida and Louisiana, where thousands are seen during winter, and where many remain during the breeding season. It is perhaps of a still more delicate constitution than the Blue Heron, *Ardea cærulea*, as no individuals remain in the neighbourhood of Charleston when the winter happens to be rather colder than usual. In its migrations eastward it rarely proceeds farther than Long Island in the State of New York; few are seen in Massachusetts, and none farther to the east. My friend Professor MACCULLOCH never heard of it in Nova Scotia, and I cannot imagine on what authority WILSON stated that it inhabits the sea-coast of North America to the Gulf of St. Lawrence. My friend NUTTALL also asserts, without mentioning on what evidence, that, by pursuing an inland course, it reaches its final destination in the wilds of Canada. It has not been observed in any part of the western country; nay, it rarely ascends the Mississippi as high as Memphis, or about two hundred miles from the mouth of the Ohio, and cannot be said to be at all abundant much farther up the great river than Natchez. In fact, the maritime districts furnish its favourite places of resort, and it rarely proceeds farther inland than fifty or sixty miles, even in the flat portions of the Carolinas, or in the Middle States, where it prefers the islands along the Atlantic coast.

While I was at Charleston, in March 1831, few had arrived from the Floridas by the 18th of that month, but on the 25th thousands were seen in the marshes and rice-fields all in full plumage. They reach the shores of New Jersey about the first week of May, when they may be seen on all parts of the coast between that district and the Gulf of Mexico. On the Mississippi, they seldom reach the low grounds about Natchez, where they also breed, earlier than the period to which they appear in the Middle States.

While migrating, they fly both by night and by day, in loose flocks of from twenty to a hundred individuals, sometimes arranging themselves in a broad front, then forming lines, and again proceeding in a straggling manner. They keep perfectly silent, and move at a height seldom exceeding a hundred yards. Their flight is light, undetermined as it were, yet well sustain-

ed, and performed by regular flappings, as in other birds of the tribe. When they have arrived at their destination, they often go to considerable distances to feed during the day, regularly returning at the approach of night to their roosts on the low trees and bushes bordering the marshes, swamps and ponds. They are very gentle at this season, and at all periods keep in flocks when not disturbed. At the approach of the breeding season, many spend a great part of the day at their roosting-places, perched on the low trees principally growing in the water, when every now and then they utter a rough, guttural sort of sigh, raising at the same moment their beautiful crest and loose recurved plumes, curving the neck, and rising on their legs to their full height, as if about to strut on the branches. They act in the same manner while on the ground mating. Then the male, with great ardour, and with the most graceful motions, passes and repasses for several minutes at a time before and around the female, whose actions are similar, although she displays less ardour. When disturbed on such occasions, they rise high in the air, sail about and over the spot in perfect silence, awaiting the departure of the intruder, then sweep along, exhibiting the most singular movements, now and then tumbling over and over like the Tumbler Pigeon, and at length alight on a tree. On the contrary, when you intrude upon them while breeding, they rise silently on wing, alight on the trees near, and remain there until you depart.

The Snowy Herons breed in large communities; and so very social are they, that they do not appear even to attempt to disturb such other birds as are wont to breed among them, the Night Herons, for instance, the Green Herons, or the Boat-tailed Grakles. I have visited some of their breeding grounds, where several hundred pairs were to be seen, and several nests were placed on the branches of the same bush, as low at times that I could easily see into them, although others were situated at a height of ten or fifteen feet. In places where these birds are often disturbed, they breed in taller trees, though rarely on very high ones. In the Floridas I found their nests on low mangroves; but wherever they are placed you find them fronting the water, over which, indeed, these Herons seem fond of placing them. The nest, which is formed of dry sticks, is rather small, and has a shallow cavity. The eggs are three, one inch and five-eighths and a half in length, one and a quarter across, of a broadly elliptical form, and having a plain pale bluish-green colour. In the Middle Districts, the usual time of laying is about the middle of May; in the Carolinas a month sooner; and in the Floridas still earlier, as there, on the 19th of May, I found the young in great numbers walking off their nests on the mangrove branches, and, like those of the Louisiana Heron, which also breeds in the same places, trying to escape by falling into the water below, and swimming in search of hiding-

places among the roots and hanging branches. Both sexes incubate. Many of the eggs are destroyed by Crows and Turkey Buzzards, which also devour the young, and many are carried off by men.

The young acquire the full beauty of their plumage in the course of the first spring, when they can no longer be distinguished from the old birds. The legs and feet are at first of a darkish olive, as is the bill, except at the base, where it is lighter, and inclining to yellow. At the approach of autumn, the crest assumes a form, and the feathers of the lower parts of the neck in front become considerably lengthened, the feet acquire a yellow tint, and the legs are marked with black on a yellowish ground; but the flowing feathers of the back do not appear until the approach of spring, when they grow rapidly, become recurved, and remain until the young are hatched, when they fall off.

The Snowy Heron, while in the Carolinas, in the month of April, resorts to the borders of the salt-water marshes, and feeds principally on shrimps. Many individuals which I opened there contained nothing else in their stomach. On the Mississippi, at the time when the shrimps are ascending the stream, these birds are frequently seen standing on floating logs, busily engaged in picking them up; and on such occasions their pure white colour renders them conspicuous and highly pleasing to the eye. At a later period, they feed on small fry, fiddlers, snails, aquatic insects, occasionally small lizards and young frogs. Their motions are generally quick and elegant, and, while pursuing small fishes, they run swiftly through the shallows, throwing up their wings. Twenty or thirty seen at once along the margins of a marsh or a river, while engaged in procuring their food, form a most agreeable sight. In autumn and early spring, they are fond of resorting to the ditches of the rice-fields, not unfrequently in company with the Blue Herons. When, on being wounded in the wing, one falls into the water, it swims off towards the nearest shore, and runs to hide itself by the side of some log, or towards a tree which if possible it climbs, ascending to its very top. When seized, they peck at you with great spirit, and are capable of inflicting a severe wound.

There is no difference between the sexes as to plumage, but the male is somewhat larger. When in good condition, its flesh is excellent eating, especially in early autumn, when it is generally very fat. Some may be seen for sale in the markets of New Orleans and other southern cities. They return southward from the Middle Districts early in October, but in the Carolinas they remain until the first frosts, when they all depart for the Floridas, where I found them during the whole winter in considerable numbers, associating with the Blue Herons.

Snowy Heron, *Ardea candidissima*, Wils. Amer. Orn., vol. vii. p. 120.
Ardea candidissima, Bonap. Syn., p. 305.
Snowy Heron, *Ardea candidissima*, Nutt. Man., vol. ii. p. 49.
Snowy Heron, *Ardea candidissima*, Aud. Orn. Biog., vol. iii. p. 317; vol. v. p. 606.

Male 22½, 38.

Resident from Texas to Florida. Migrates in spring as far as Massachusetts. Breeds in all intermediate districts; up the Mississippi to Memphis. Abundant.

Adult Male in full spring plumage.

Bill longer than the head, straight, compressed, tapering to a point, the mandibles nearly equal. Upper mandible with the dorsal line nearly straight, the ridge broad and slightly convex at the base, narrowed towards the end, a groove from the base to two-thirds of its length, beneath which the sides are convex, the edges thin and sharp, with a slight notch close to the very acute tip. Nostrils basal, linear, longitudinal, with a membrane above and behind. Lower mandible with the angle extremely narrow and elongated, the dorsal line beyond it ascending and almost straight, the edges sharp and slightly inflected, the tip acuminate.

Head rather small, oblong, compressed. Neck very long and slender. Body slender and compressed. Feet very long; tibia elongated, its lower half bare, very slender, covered all round with angular scales, of which the posterior are scutelliform; tarsus elongated, slender, compressed, anteriorly covered with numerous scutella, laterally and behind with angular scales. Toes of moderate length, rather slender, scutellate above, reticularly granulate beneath; third toe much longer than second, which is very little shorter than fourth, the hind toe much shorter but strong. Claws rather small, arched, compressed, acute, that of hind toe much larger, the inner edge of that of the third regularly pectinate.

Space between the bill and eye, and around the latter, bare, as is the lower half of the tibia. Plumage soft and blended. Feathers of the upper and hind part of the head, very long, loose, decurved; of the sides, and especially of the lower part of the neck, also much elongated; of the middle of the back very long, loose, and hanging over the sides and rump, but with their extremities recurved. Wings of moderate length; primaries tapering and rounded, the third longest, the second very little shorter, first and fourth about equal; secondaries broad and rounded, some of the inner as long as the longest primaries, when the wing is closed. Tail very short, small, slightly rounded, of twelve rather weak feathers.

Bill black, the bare space at its base yellow. Iris and edges of eyelids yellow. Tibia and tarsus black, the lower part of the latter behind and the toes bright yellow; claws bluish-black. The plumage is pure white.

Length to end of tail 22½ inches, to end of wings 23, to end of claws 30½; extent of wings 38; wing from flexure 10½; tail 3; loose feathers 1½ beyond the tail; bill along the ridge $3_{\frac{1}{12}}$; along the edge of lower mandible 3⅜; bare part of tibia 2½; tarsus $3\frac{11}{12}$; middle toe 2½, its claw $\frac{4}{12}$. Weight 12 oz.

The elongated feathers of the back are composed of two scapular series, and of those crossing the humerus. The mouth as in the other species. Tongue 1 inch 3 twelfths long, as in the last species. Œsophagus 14 inches long, at the commencement 1 inch 9 twelfths in width, contracting to 10 twelfths; its greatest diameter within the thorax 1 inch 4 twelfths; proventricular belt 8 twelfths in breadth. Stomach remarkably small, roundish, 10 twelfths in diameter, with a globular pyloric lobe, 4½ twelfths in diameter; its muscular coat thin, the tendons 4 twelfths in breadth; the inner surface smooth and soft. Lobes of the liver 1½ inches and 1¼ inches in length; gall-bladder oblong, 9 twelfths long, 5 twelfths broad. Intestine 3 feet 10½ inches long, of 24 folds; its greatest width in the duodenal part 1½ twelfths, its smallest near the rectum 1 twelfth. The rectum is 2 inches 10 twelfths long, 2¾ twelfths in breadth; the cloaca globular, 1¼ inches in diameter; the cœcum a small knob 1 twelfth long, and of the same width.

Trachea 10 inches long, its average breadth 2¼ twelfths, considerably flattened; the rings 188, with 4 dimidiate. Bronchial half rings 18 and 16. Muscles as in the other species.

FAMILY XXXIX.—ANATINÆ. DUCKS.

Bill of moderate length, stout, straight, depressed toward the end, obtuse, covered with soft skin; upper mandible transversely convex, with the margins internally lamellate, the tip furnished with a decurved horny broad unguis; lower mandible with the angle long and narrow, the crura slender, flattened, the edges internally lamellate, the tip a flattened unguis. Nostrils elliptical, open, sub-basal. Head of moderate size; neck long or of moderate length, slender; body full; legs generally short, stout, with little of the tibia bare; tarsus scutellate; toes four, first small; anterior three palmate. Claws moderate, arched, compressed, obtuse. Plumage very full, dense,

soft. Wings of moderate length, curved, acute, outer two quills longest. Tail short, of twelve or more feathers. Tongue fleshy, with a median groove, lateral reversed papillæ, laminæ, or bristles, and a semicircular thin horny tip; œsophagus narrow, slightly enlarged at the lower part of the neck; stomach a transversely elliptical gizzard, of which the lateral muscles are excessively developed, the epithelium dense, with two concave grinding surfaces; intestine long and wide; cœca long, cylindrical, contracted at the base. Trachea various, generally much enlarged at the bifurcation, without inferior laryngeal muscles, or only with the slips of the lateral muscles prolonged. Nest generally on the ground; eggs numerous. Young clothed with stiffish down, and able to walk and swim from birth.

Genus I.—PHŒNICOPTERUS, *Linn.* FLAMINGO.

Bill more than double the length of the head, straight and higher than broad for half its length, then deflected, and tapering to an obtuse point; upper mandible with its dorsal line at first straight, then convex, and again straight nearly to the end, when it becomes convex at the tip, the ridge broad and concave, on the deflected part expanded into a lanceolate plate, having a shallow groove in the middle, and separated from the edges by a narrow groove, its extremity narrow and thin edged, but obtuse, this part being analogous to the unguis of Ducks; lower mandible narrower than the upper at its base, but much broader in the rest of its extent; its angle rather long, wide, and filled with bare skin; its dorsal line concave, but at the tip convex, the ridge deeply depressed, there being a wide channel in its place, the sides nearly erect and a little convex, with six ridges on each side toward the tip. Both mandibles internally lamellate, the edge of the lower much incurved. Nostrils linear, direct, and sub-basal, operculate. Head small, ovate; neck extremely elongated, and very slender; body slender; legs extremely long; tibia bare for more than half its length, and with the long tarsus anteriorly scutellate; hind toe very small and elevated; anterior toes connected by emarginate webs, scutellate above, tesselate beneath. Claws oblong, obtuse, depressed. Space between the bill and the eye bare; plumage compact; wings long, very broad, pointed; second quill longest; some of the secondaries extremely elongated, so as to extend far beyond the primaries when the wind is closed. Tail very short. Tongue confined by the lower mandible, fleshy, compressed, decurved, with recurved conical papillæ; œsophagus extremely narrow, but at the lower part of the neck

American Flamingo

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. *Adult ♂ Male* Lith. & Col. Bowen & Co. Philada.

enlarged into a crop; proventriculus elliptical; stomach a very muscular, transversely elliptical gizzard, exactly resembling that of a Goose or Duck, with the epithelium dense, and longitudinally sulcate; intestine very long, and of considerable width; cœca rather long; cloaca globular.

AMERICAN FLAMINGO.

PHŒNICOPTERUS RUBER, *Linn.*

PLATE CCCLXXV.—ADULT MALE.

On the 7th of May, 1832, while sailing from Indian Key, one of the numerous islets that skirt the south-eastern coast of the Peninsula of Florida, I for the first time saw a flock of Flamingoes. It was on the afternoon of one of those sultry days which, in that portion of the country, exhibit towards evening the most glorious effulgence that can be conceived. The sun, now far advanced toward the horizon, still shone with full splendour, the ocean around glittered in its quiet beauty, and the light fleecy clouds that here and there spotted the heavens, seemed flakes of snow margined with gold. Our bark was propelled almost as if by magic, for scarcely was a ripple raised by her bows as we moved in silence. Far away to seaward we spied a flock of Flamingoes advancing in "Indian line," with well-spread wings, outstretched necks, and long legs directed backwards. Ah! reader, could you but know the emotions that then agitated my breast! I thought I had now reached the height of all my expectations, for my voyage to the Floridas was undertaken in a great measure for the purpose of studying these lovely birds in their own beautiful islands. I followed them with my eyes, watching as it were every beat of their wings; and as they were rapidly advancing towards us, Captain DAY, who was aware of my anxiety to procure some, had every man stowed away out of sight and our gunners in readiness. The pilot, Mr. EGAN, proposed to offer the first taste of his "groceries" to the leader of the band. He was a first-rate shot, and had already killed many Flamingoes. The birds were now, as I thought, within a hundred and fifty yards; when suddenly, to our extreme disappointment, their chief veered away, and was of course followed by the rest. Mr.

EGAN, however, assured us that they would fly round the Key, and alight not far from us, in less than ten minutes, which in fact they did, although to me these minutes seemed almost hours. "Now they come," said the pilot, "keep low." This we did; but, alas! the Flamingoes were all, as I suppose, very old and experienced birds, with the exception of one, for on turning round the lower end of the Key, they spied our boat again, sailed away without flapping their wings, and alighted about four hundred yards from us, and upwards of one hundred from the shore, on a "soap flat" of vast extent, where neither boat nor man could approach them. I however watched their motions until dusk, when we reluctantly left the spot and advanced toward Indian Key. Mr. EGAN then told me that these birds habitually returned to their feeding-grounds toward evening, that they fed during the greater part of the night, and were much more nocturnal in their habits than any of the Heron tribe.

When I reached Key West, my first inquiries, addressed to Dr. BENJAMIN STROBEL, had reference to the Flamingoes, and I felt gratified by learning that he had killed a good number of them, and that he would assist us in procuring some. As on that Key they are fond of resorting to the shallow ponds formerly kept there as reservoirs of water, for the purpose of making salt, we visited them at different times, but always without success; and, although I saw a great number of them in the course of my stay in that country, I cannot even at this moment boast of having had the satisfaction of shooting a single individual.

A very few of these birds have been known to proceed eastward of the Floridas beyond Charleston in South Carolina, and some have been procured there within eight or ten years back. None have ever been observed about the mouths of the Mississippi; and to my great surprise I did not meet with any in the course of my voyage to the Texas, where, indeed, I was assured they had never been seen, at least as far as Galveston Island. The western coast of Florida, and some portions of that of Alabama, in the neighbourhood of Pensacola, are the parts to which they mostly resort; but they are said to be there always extremely shy, and can be procured only by waylaying them in the vicinity of their feeding-grounds toward evening, when, on one occasion, Dr. STROBEL shot several in the course of a few hours. Dr. LEITNER also procured some in the course of his botanical excursions along the western coast of the Floridas, where he was at last murdered by some party of Seminole Indians, at the time of our last disastrous war with those children of the desert.

Flamingoes, as I am informed, are abundant on the Island of Cuba, more especially on the southern side of some of its shores, and where many islets at some distance from the mainland afford them ample protection. In their

flight they resemble Ibises, and they usually move in lines, with the neck and legs fully extended, alternately flapping their wings for twenty or thirty yards and sailing over a like space. Before alighting they generally sail round the place for several minutes, when their glowing tints become most conspicuous. They very rarely alight on the shore itself, unless, as I am told, during the breeding season, but usually in the water, and on shallow banks, whether of mud or of sand, from which, however, they often wade to the shores. Their walk is stately and slow, and their cautiousness extreme, so that it is very difficult to approach them, as their great height enables them to see and watch the movements of their various enemies at a distance. When travelling over the water, they rarely fly at a greater height than eight or ten feet; but when passing over the land, no matter how short the distance may be, they, as well as Ibises and Herons, advance at a considerable elevation. I well remember that on one occasion, when near Key West, I saw one of them flying directly towards a small hammock of mangroves, to which I was near, and towards which I made, in full expectation of having a fine shot. When the bird came within a hundred and twenty yards, it rose obliquely, and when directly over my head, was almost as far off. I fired, but with no other effect than that of altering its course, and inducing it to rise still higher. It continued to fly at this elevation until nearly half a mile off, when it sailed downwards, and resumed its wonted low flight.

Although my friends Dr. JOHN BACHMAN, Dr. WILSON, and WILLIAM KUNHARDT, Esq., of Charleston, have been at considerable trouble in endeavouring to procure accounts of the nidification of these birds and their habits during the breeding season, and although they, as well as myself, have made many inquiries by letter respecting them, of persons residing in Cuba, all that has been transmitted to me has proved of little interest. I am not, however, the less obliged by the kind intentions of these individuals, one of whom, A. MALLORY, Esq., thus writes to Captain CROFT.

"*Matanzas, April* 20, 1837.

"Capt. CROFT,

"Dear Sir,—I have made inquiry of several of the fishermen, and salt-rakers, who frequent the keys to the windward of this place, in regard to the habits of the Flamingo, and have obtained the following information, which will be found, I believe, pretty correct: 1st, They build upon nearly all the Keys to the windward, the nearest of which is called Collocino Lignas. 2ndly, It builds upon the ground. 3dly, The nest is an irregular mass of earth dug in the salt ponds, and entirely surrounded by water. It is scooped up from the immediate vicinity to the height of two or three feet,

and is of course hollow at the top. There is no lining, nor any thing but the bare earth. 4thly, The number of eggs is almost always two. When there is one, there has probably been some accident. The time of incubation is not known. The egg is white, and near the size of the Goose's egg. On scraping the shell, it has a bluish tinge. 5thly, The colour of the young is nearly white, and it does not attain the full scarlet colour until two years old. 6thly, When the young first leave the nest, they take to the water, and do not walk for about a fortnight, as their feet are almost as tender as jelly. I do not think it easy to procure an entire nest; but I am promised some of the eggs, this being the time to procure them.

"Very truly your obedient servant,

"A. MALLORY."

Another communication is as follows:

"The Flamingo is a kind of bird that lives in lagoons having a communication with the sea. This bird makes its nest on the shore of the same lagoon, with the mud which it heaps up to beyond the level of the water. Its eggs are about the size of those of a Goose; it only lays two or three at a time, which are hatched about the end of May. The young when they break the shell have no feathers, only a kind of cottony down which covers them. They immediately betake themselves to the water to harden their feet. They take from two to three months before their feathers are long enough to enable them to fly. The first year they are rose-coloured, and in the second they obtain their natural colour, being all scarlet; half their bill is black, and the points of the wings are all black; the eyes entirely blue. Its flesh is savoury, and its tongue is pure fat. It is easily tamed, and feeds on rice, maize-meal, &c. Its body is about a yard high, and the neck about half as much. The breadth of the nest, with little difference, is that of the crown of a hat. The way in which the female covers the eggs is by standing in the water on one foot and supporting its body on the nest. This bird always rests in a lagoon, supporting itself on one leg alternately; and it is to be observed that it always stands with its front to the wind."

An egg, presented to me by Dr. BACHMAN, and of which two were found in the nest, measures three inches and three-eighths in length, two inches and one-eighth in breadth, and is thus of an elongated form. The shell is thick, rather rough or granulated, and pure white externally, but of a bluish tint when the surface is scraped off.

RED FLAMINGO, *Phœnicopterus ruber*, Wils. Amer. Orn., vol. viii. p. 145.

PHŒNICOPTERUS RUBER, Bonap. Syn., p. 348.

AMERICAN OR RED FLAMINGO, Nutt. Man., vol. ii. p. 71.

AMERICAN FLAMINGO, *Phœnicopterus ruber*, Aud. Orn. Biog., vol. v. p. 255.

Male, 45½, 66.

Rather rare, and only during summer in the Florida Keys, and the western coast of Florida. Accidental as far as South Carolina. Constantly resident in Cuba.

Adult Male.

Bill more than double the length of the head, straight and higher than broad for half its length, then deflected and tapering to an obtuse point. Upper mandible with its dorsal line straight, convex at the curve, and again straight nearly to the end, when it becomes convex at the tip; the ridge broad and convex, on the deflected part expanded into a lanceolate plate, having a shallow groove in the middle, and separated from the edges by a narrow groove; its extremity narrow, and thin-edged, but obtuse, this part being analogous to the unguis of Ducks and other birds of that tribe. Lower mandible narrower than the upper at its base, but much broader in the rest of its extent; its angle rather long, wide, and filled with bare skin; its dorsal line concave, but at the tip convex, the ridge deeply depressed, there being a wide channel in its place, the sides nearly erect and a little convex, with six ridges on each side toward the tip. The edges of the upper mandible are furnished with about 150 oblique lamellæ, of which the external part is perpendicular, tapering, pointed, and tooth-like. The edge of the lower mandible is incurved in an extraordinary degree, leaving a convex upper surface about ½ inch in breadth, covered in its whole extent with transverse very delicate lamellæ, with an external series of larger lamellæ. The whole surface of the bill is covered with a thickened leathery skin, which becomes horny toward the end. The nostrils are linear, direct, subbasal, nearer the margin than the ridge, operculate, 1¼ inches long.

Head small, ovate; neck extremely elongated, and very slender, body slender. Legs extremely long; the bare part of the tibia 9½ inches, with 30 very broad scutella before, and about 40 behind, the scutella both here and on the tarsus almost meeting so as scarcely to leave any interspace. Tarsus extremely long, slender, its anterior scutella 54, posterior 65. Hind toe very small, with 3 large scutella, its claw oblong, depressed, obtuse; it is 5 twelfths of an inch shorter than the outer, which is also 5 twelfths shorter than the middle toe. The webs are anteriorly emarginate and crenate; they are very thick, rugous, and reticulated, especially on the sole; the lower surface of the toes is tesselated with squarish, flattish, thickened scales, resembling mosaic work, and the upper surface is covered with numerous broad, but short scutella. The claws are oblong, obtuse, depressed, and very similar to those of a monkey.

The space between the bill and the eye is bare. The plumage is generally compact, the feathers rounded; those on the neck short. Wings long,

very broad, pointed; the first primary half a twelfth of an inch shorter than the second, which is longest, and exceeds the third by one-twelfth; some of the inner secondaries much elongated, tapering, and extending five or six inches beyond the first primary when the wing is closed. Tail very short.

Bill black beyond the curve, then orange, and towards the base pure yellow, of which colour also is the bare skin at its base. Iris blue. Feet lake-colour. The plumage is of a very rich pure scarlet, excepting the ten primaries, and twenty of the secondaries, which are black, the inner ten elongated secondaries being scarlet.

Length to carpal joint 27⅜ inches, to end of wing 44, to end of tail 45½, to end of claws 62½; extent of wings 66; bare part of tibia 9; tarsus 13½; middle toe and claw 3⅝; hind toe and claw ½; spread of foot from outer to inner claw 5; wing from flexure 16; tail 6; circumference of body 24. Weight 7 lbs. 8 oz.

The Female is similar to the male, but much smaller; its weight 6 lbs. 4 oz.

A male preserved in spirits. On the roof of the mouth is a large prominent median ridge, which toward the end has two sharp edges; the sides concave and covered with lamellæ. The lower mandible is deeply and widely grooved, forming a cavity 1 inch in depth at the curvature, the tip narrowed but obtuse, and with a flattened broadly ovate surface above. The tongue, which lies in this deep groove, by which it is confined so as to be capable of little motion, is a fleshy, somewhat compressed, decurved body, 2 inches 2 twelfths long, measured along its upper median line, having at its base on each side three series of very pointed papillæ, and on each side about 20 conical, recurved, horny, acuminate papillæ, about ¼ inch in length; between which is a narrow median groove. These papillæ terminate at the curvature, beyond which is a lanceolate flattened horny surface, with a thin elevated margin, the organ at that part tapering to an obtuse point, horny on its lower surface. The nostrils are 1¼ inches long; the aperture of the ear very small, 2½ twelfths in diameter, that of the eye 4½ twelfths. In this specimen the whole of the thoracic and abdominal viscera have been removed.

The trachea, which is narrow, little flattened, and with its rings firm, passes down in front of the vertebræ to the distance of 12 inches, and is then deflected to the right side for 11 inches more. The diameter at the upper part is 4⅜ twelfths, and it gradually enlarges to 5¼ twelfths; at the lower part of the neck its greatest breadth is 7 twelfths. It then passes over the vertebræ, continuing of the same breadth, enters the thorax, contracts at its lower part and is compressed, its diameter being 4 twelfths

The number of rings is 330. The bronchi are wide, short, compressed, of about 15 half rings.

The aperture of the glottis is 6 twelfths long; at its anterior part is a transverse series of 12 short papillæ directed forward, and behind it are numerous pointed papillæ, of which the middle are largest. The muscles of the upper larynx are two, one passing obliquely from the edge of the marginal cartilage to the edge of the thyroid bone, for the purpose of opening the aperture of the glottis; the other passing from the fore part of the edge of the thyroid bone to the base of the cricoid and arytenoid, for the purpose of pulling these parts forward, and thus closing the aperture. The contractor muscles are of moderate strength, and the trachea is enveloped in numerous layers of dense cellular tissue. The sterno-tracheals, which are of moderate size, are in part a continuation of the contractors, which moreover send a slip to the inferior larynx.

Fig. 1.

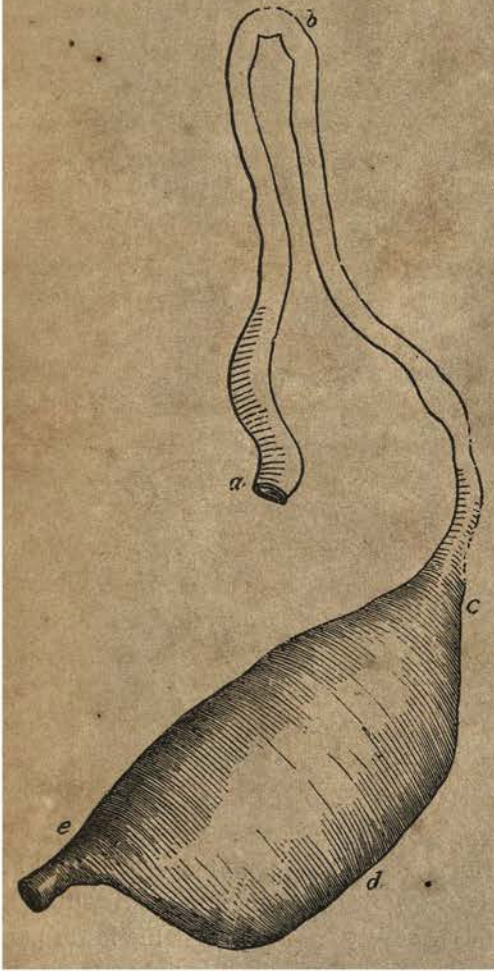


Fig. 3.

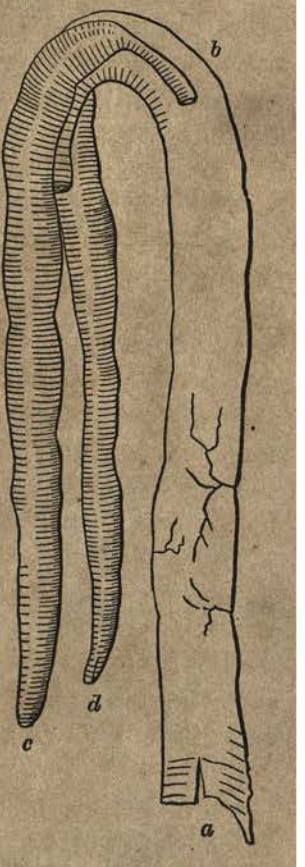
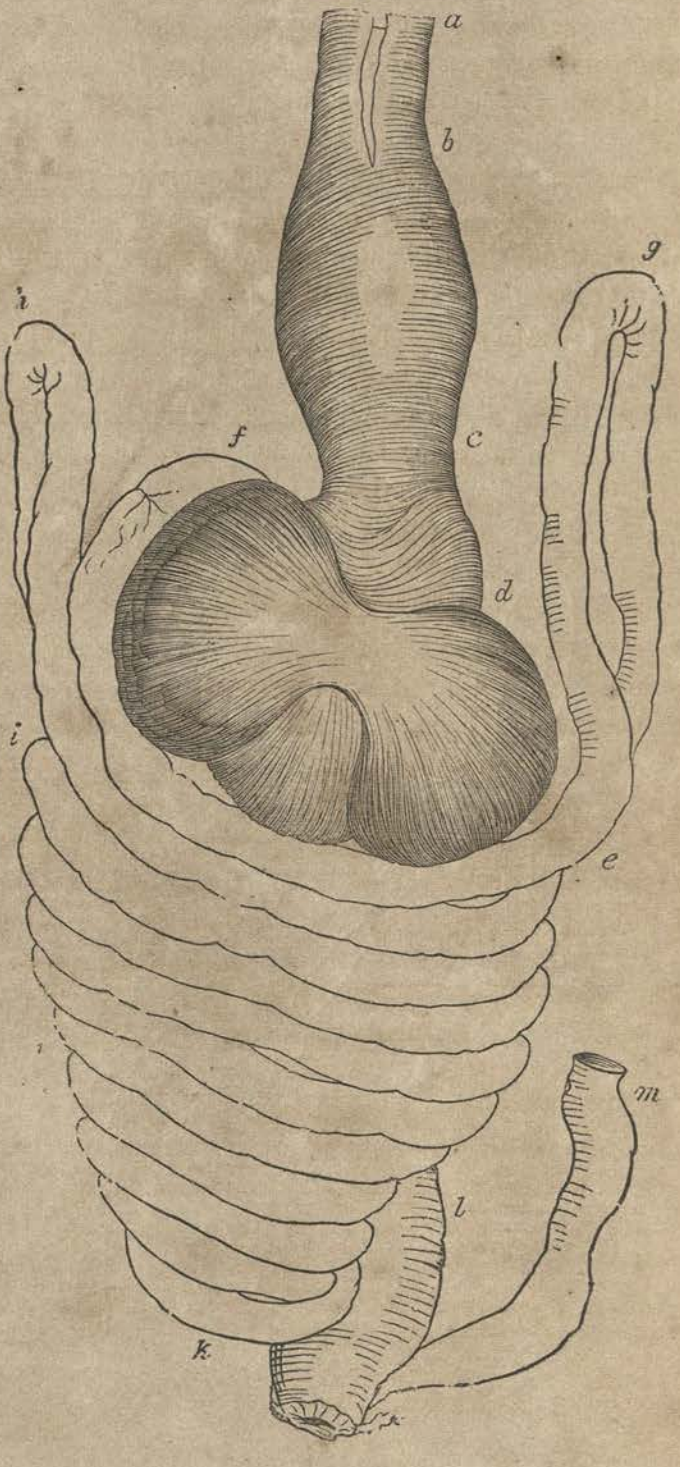


Fig. 2.



A female also preserved in spirits is much smaller. The œsophagus, Fig. 1, *a b c d* (diminished one-third), is 2 feet 1 inch long, only 3 twelfths in width at the upper part, and diminishes to 2½ twelfths. At the lower part

of the neck however it enlarges into a crop, *c d e*, 3¼ inches long and 2¼ inches in its greatest width. On entering the thorax, the œsophagus has a diameter of 9 twelfths; the proventriculus, Fig. 2, *a b c*, enlarges to an ovate sac, 1¼ inches in its greatest breadth. The stomach, *d e f*, is a very muscular gizzard, of an elliptical form, placed obliquely, and exactly resembling that of a Duck or Goose; its length 1 inch 7 twelfths, its breadth 2 inches 3 twelfths. Its lateral muscles are extremely developed, the left being 1 inch 1 twelfth thick, the other 1 inch; the epithelium thick, tough, brownish-red, marked with longitudinal coarse grooves, but not flattened on the two surfaces, opposite the muscles, as is the case in Ducks and Geese. The proventricular glands are very large, and occupy a belt 1¼ inches in breadth. The contents of the stomach are numerous very small univalve shells of a great variety of species and fragments of larger shells, which, however, have probably been used in place of gravel; for the structure of the œsophagus and stomach would indicate that the bird is graminivorous. The intestine, *f k*, which is very long, and of considerable width, its diameter being greater than that of the upper part of the œsophagus, is very regularly and beautifully convoluted, presenting, when the bird is opened in front, 10 parallel convolutions, *f g h i j k*, inclining from right to left at an angle of about 30°. The duodenum, *f g h*, passes round the edge of the stomach, curves upwards as far as the fore part of the proventriculus, is then doubled on itself, reaches the right lobe of the liver, which has a large elliptical gall-bladder, and forms 32 half curves in all, ending above the stomach in the rectum. The intestine is 11 feet 4 inches long, its average diameter 4½ twelfths. The rectum, Fig. 3, *a b*, is 5½ inches long, its diameter ½ inch. The cœca, *c d*, are 4 inches long; for ½ inch at the base their diameter is 1 twelfth, immediately after 4 twelfths; they then taper to the extremity, which is obtuse. The cloaca is very large and globular.

Genus II.—ANSER, *Briss.* GOOSE.

Bill shorter than the head, rather higher than broad at the base, somewhat conical, depressed toward the end, rounded at the tip; upper mandible with the dorsal line sloping, the ridge broad and flattened, the sides sloping, the edges soft and obtuse, internally with numerous oblique marginal lamellæ, the unguis obovate, convex; nasal groove oblong, filled by the soft membrane of the bill; nostrils medial, lateral, longitudinal, narrow-elliptical, open, pervious, lower mandible straight, with the angle very long, narrow, and rounded, the edges soft and obtuse, with numerous oblique lamellæ, the tip broadly convex. Head small, oblong, compressed; neck long and slender; body very full, slightly depressed. Feet short, stout; tibia bare for a short space below; tarsus short, a little compressed, covered all round with angular scales; hind toe very small and elevated, third toe longest, fourth longer than second; all reticulated at the base, scutellate toward the end, the anterior webbed. Claws small, arched, rather compressed. Plumage close, compact above, blended beneath. Wings long, convex, the second quill longest, the first and third nearly equal. Tail very short, of sixteen or more feathers.

THE CANADA GOOSE.

ANSER CANADENSIS, *Linn.*

PLATE CCCLXXVI.—Male and Female.

Although the Canada Goose is considered as a northern species, the number of individuals that remain at all seasons in the milder latitudes, and in different portions of the United States, fully entitles this bird to be looked upon as a permanent resident there. It is found to breed sparingly at the

Canada Goose

1 Male 2 Female

Drawn from Nature by J.J Audubon FRSFLS

Lith.d Printed & Col.d by J.T. Bowen Philad.a

present day, by many of the lakes, lagoons, and large streams of our Western Districts, on the Missouri, the Mississippi, the lower parts of the Ohio, on Lake Erie, the lakes farther north, and in several large pools situated in the interior of the eastern parts of the States of Massachusetts and Maine. As you advance farther toward the east and north, you find it breeding more abundantly. While on my way to Labrador, I found it in the Magdeleine Islands, early in June, sitting on its eggs. In the Island of Anticosti there is a considerable stream, near the borders of which great numbers are said to be annually reared; and in Labrador these birds breed in every suitable marshy plain. The greater number of those which visit us from still more northern regions, return in the vernal season, like many other species, to the dismal countries which gave them birth.

Few if any of these birds spend the winter in Nova Scotia, my friend Mr. THOMAS MACCULLOCH having informed me that he never saw one about Pictou at that period. In spring, as they proceed northward, thousands are now and then seen passing high in the air; but in autumn, the flocks are considerably smaller, and fly much lower. During their spring movements, the principal places at which they stop to wait for milder days are Bay Chaleur, the Magdeleine Islands, Newfoundland, and Labrador, at all of which some remain to breed and spend the summer.

The general spring migration of the Canada Goose, may be stated to commence with the first melting of the snows in our Middle and Western Districts, or from the 20th of March to the end of April, but the precise time of its departure is always determined by the advance of the season, and the vast flocks that winter in the great savannahs or swampy prairies southwest of the Mississippi, such as exist in Opellousas, on the borders of the Arkansas river, or in the dismal "Everglades" of the Floridas, are often seen to take their flight, and steer their course northward, a month earlier than the first of the above mentioned periods. It is indeed probable that the individuals of a species most remote from the point at which the greater number ultimately assemble, commence their flight earlier than those which have passed the winter in stations nearer to it.

It is my opinion that all the birds of this species, which leave our States and territories each spring for the distant north, pair before they depart. This, no doubt, necessarily results from the nature of their place of summer residence, where the genial season is so short as scarcely to afford them sufficient time for bringing up their young and renewing their plumage, before the rigours of advancing winter force them to commence their flight towards milder countries. This opinion is founded on the following facts:—I have frequently observed large flocks of Geese, in ponds, on marshy grounds, or even on dry sand-bars, the mated birds renewing their courtship as early as

the month of January, while the other individuals would be contending or coquetting for hours every day, until all seemed satisfied with the choice they had made, after which, although they remained together, any person could easily perceive that they were careful to keep in pairs. I have observed also that the older the birds, the shorter were the preliminaries of their courtship, and that the barren individuals were altogether insensible to the manifestations of love and mutual affection that were displayed around them. The bachelors and old maids, whether in regret, or not caring to be disturbed by the bustle, quietly moved aside, and lay down in the grass or sand at some distance from the rest; and whenever the flocks rose on wing, or betook themselves to the water, these forlorn birds always kept behind. This mode of preparing for the breeding season has appeared to me the more remarkable, that, on reaching the place appointed for their summer residence, the birds of a flock separate in pairs, which form their nests and rear their young at a considerable distance from each other.

It is extremely amusing to witness the courtship of the Canada Goose in all its stages; and let me assure you, reader, that although a Gander does not strut before his beloved with the pomposity of a Turkey, or the grace of a Dove, his ways are quite as agreeable to the female of his choice. I can imagine before me one who has just accomplished the defeat of another male after a struggle of half an hour or more. He advances gallantly towards the object of contention, his head scarcely raised an inch from the ground, his bill open to its full stretch, his fleshy tongue elevated, his eyes darting fiery glances, and as he moves he hisses loudly, while the emotion which he experiences, causes his quills to shake, and his feathers to rustle. Now he is close to her who in his eyes is all loveliness; his neck bending gracefully in all directions, passes all round her, and occasionally touches her body; and as she congratulates him on his victory, and acknowledges his affection, they move their necks in a hundred curious ways. At this moment fierce jealousy urges the defeated gander to renew his efforts to obtain his love; he advances apace, his eye glowing with the fire of rage; he shakes his broad wings, ruffles up his whole plumage, and as he rushes on the foe, hisses with the intensity of anger. The whole flock seems to stand amazed, and opening up a space, the birds gather round to view the combat. The bold bird who has been caressing his mate, scarcely deigns to take notice of his foe, but seems to send a scornful glance towards him. He of the mortified feelings, however, raises his body, half opens his sinewy wings, and with a powerful blow, sends forth his defiance. The affront cannot be borne in the presence of so large a company, nor indeed is there much disposition to bear it in any circumstances; the blow is returned with vigour, the aggressor reels for a moment, but he soon recovers, and now the combat

rages. Were the weapons more deadly, feats of chivalry would now be performed; as it is, thrust and blow succeed each other like the strokes of hammers driven by sturdy forgers. But now, the mated gander has caught hold of his antagonist's head with his bill; no bull-dog could cling faster to his victim; he squeezes him with all the energy of rage, lashes him with his powerful wings, and at length drives him away, spreads out his pinions, runs with joy to his mate, and fills the air with cries of exultation.

But now, see yonder, not a couple, but half a dozen of ganders are engaged in battle! Some desperado, it seems, has fallen upon a mated bird, and several bystanders, as if sensible of the impropriety of such conduct, rush to the assistance of the wronged one. How they strive and tug, biting, and striking with their wings! and how their feathers fly about! Exhausted, abashed, and mortified, the presumptuous intruder retreats in disgrace;—there he lies, almost breathless, on the sand!

Such are the conflicts of these ardent lovers, and so full of courage and of affection towards their females are they, that the approach of a male invariably ruffles their tempers as well as their feathers. No sooner has the goose laid her first egg, than her bold mate stands almost erect by her side, watching even the rustling sound of the breeze. The least noise brings from him a sound of anger. Should he spy a racoon making its way among the grass, he walks up to him undauntedly, hurls a vigorous blow at him, and drives him instantly away. Nay I doubt if man himself, unarmed, would come off unscathed in such an encounter. The brave gander does more; for, if imminent danger excite him, he urges his mate to fly off, and resolutely remains near the nest until he is assured of her safety, when he also betakes himself to flight, mocking as it were by his notes his disappointed enemy.

Suppose all to be peace and quiet around the fond pair, and the female to be sitting in security upon her eggs. The nest is placed near the bank of a noble stream or lake; the clear sky is spread over the scene, the bright beams glitter on the waters, and a thousand odorous flowers give beauty to the swamp which of late was so dismal. The gander passes to and fro over the liquid element, moving as if lord of the waters; now he inclines his head with a graceful curve, now sips to quench his thirst; and, as noontide has arrived, he paddles his way towards the shore, to relieve for awhile his affectionate and patient consort. The lisping sounds of their offspring are heard through the shell; their little bills have formed a breach in the inclosing walls; full of life, and bedecked with beauty, they come forth, with tottering steps and downy covering. Toward the water they now follow their careful parent, they reach the border of the stream, their mother already floats on the loved element, one after another launches forth, and

now the flock glides gently along. What a beautiful sight! Close by the grassy margin, the mother slowly leads her innocent younglings; to one she shews the seed of the floating grass, to another points out the crawling slug. Her careful eye watches the cruel turtle, the garfish, and the pike, that are lurking for their prey, and, with head inclined, she glances upwards to the Eagle or the Gull that are hovering over the water in search of food. A ferocious bird dashes at her young ones; she instantly plunges beneath the surface, and, in the twinkling of an eye, her brood disappear after her; now they are among the thick rushes, with nothing above water but their little bills. The mother is marching towards the land, having lisped to her brood in accents so gentle that none but they and her mate can understand their import, and all are safely lodged under cover until the disappointed Eagle or Gull bears away.

More than six weeks have now elapsed. The down of the goslings, which was at first soft and tufty, has become coarse and hairlike. Their wings are edged with quills, and their bodies bristled with feathers. They have increased in size, and, living in the midst of abundance, they have become fat, so that on shore they make their way with difficulty, and as they are yet unable to fly, the greatest care is required to save them from their numerous enemies. They grow apace, and now the burning days of August are over. They are able to fly with ease from one shore to another, and as each successive night the hoarfrosts cover the country, and the streams are closed over by the ice, the family joins that in their neighbourhood, which is also joined by others. At length they spy the advance of a snow-storm, when the ganders with one accord sound the order for their departure.

After many wide circlings, the flock has risen high in the thin air, and an hour or more is spent in teaching the young the order in which they are to move. But now, the host has been marshalled, and off it starts, shewing, as it proceeds, at one time an extended front, at another a single lengthened file, and now arraying itself in an angular form. The old males advance in front, the females follow, the young come in succession according to their strength, the weakest forming the rear. Should one feel fatigued, his position is changed in the ranks, and he assumes a place in the wake of another, who cleaves the air before him; perhaps the parent bird flies for awhile by his side to encourage him. Two, three, or more days elapse before they reach a secure resting-place. The fat with which they were loaded at their departure has rapidly wasted; they are fatigued, and experience the keen gnawings of hunger; but now they spy a wide estuary, towards which they direct their course. Alighting on the water, they swim to the beach, stand, and gaze around them; the young full of joy, the old full of fear, for well are they aware that many foes have been waiting their arrival. Silent all night

remains the flock, but not inactive; with care they betake themselves to the grassy shores, where they allay the cravings of appetite, and recruit their wasted strength. Soon as the early dawn lightens the surface of the deep they rise into the air, extend their lines, and proceed southward, until arriving in some place where they think they may be enabled to rest in security, they remain during the winter. At length, after many annoyances, they joyfully perceive the return of spring, and prepare to fly away from their greatest enemy man.

The Canada Goose often arrives in our Western and Middle Districts as early as the beginning of September, and does not by any means confine itself to the sea-shore. Indeed, my opinion is, that for every hundred seen during the winter along our large bays and estuaries, as many thousands may be found in the interior of the country, where they frequent the large ponds, rivers, and wet savannahs. During my residence in the State of Kentucky, I never spent a winter without observing immense flocks of these birds, especially in the neighbourhood of Henderson, where I have killed many hundreds of them, as well as on the Falls of the Ohio at Louisville, and in the neighbouring country, which abounds in ponds overgrown with grasses and various species of Nymphæ, on the seeds of which they greedily feed. Indeed all the lakes situated within a few miles of the Missouri and Mississippi, or their tributaries, are still amply supplied with them from the middle of autumn to the beginning of spring. In these places, too, I have found them breeding, although sparingly. It seems to me more than probable, that the species bred abundantly in the temperate parts of North America before the white population extended over them. This opinion is founded on the relations of many old and respectable citizens of our country, and in particular of General GEORGE CLARK, one of the first settlers on the banks of the Ohio, who, at a very advanced age, assured me that, fifty years before the period when our conversation took place (about seventy-five years from the present time), wild geese were so plentiful at all seasons of the year, that he was in the habit of having them shot to feed his soldiers, then garrisoned near Vincennes, in the present State of Indiana. My father, who travelled down the Ohio shortly after BRADDOCK'S defeat, related the same to me; and I, as well as many persons now residing at Louisville in Kentucky, well remember that, twenty-five or thirty years ago, it was quite easy to procure young Canada Geese in the ponds around. So late as 1819, I have met with the nests, eggs, and young of this species near Henderson. However, as I have already said, the greater number remove far north to breed. I have never heard of an instance of their breeding in the Southern States. Indeed so uncongenial to their constitution seems the extreme heat

of these parts to be, that the attempts made to rear them in a state of domestication very rarely succeed.

The Canada Goose, when it remains with us to breed, begins to form its nest in March, making choice of some retired place not far from the water generally among the rankest grass, and not unfrequently under a bush. It is carefully formed of dry plants of various kinds, and is of a large size, flat, and raised to the height of several inches. Once only did I find a nest elevated above the ground. It was placed on the stump of a large tree, standing in the centre of a small pond, about twenty feet high, and contained five eggs. As the spot was very secluded, I did not disturb the birds, anxious as I was to see in what manner they should convey the young to the water. But in this I was disappointed, for, on going to the nest, near the time at which I expected the process of incubation to terminate, I had the mortification to find that a racoon, or some other animal, had destroyed the whole of the eggs, and that the birds had abandoned the place. The greatest number of eggs which I have found in the nest of this species was nine, which I think is more by three than these birds usually lay in a wild state. In the nests of those which I have had in a domesticated state, I have sometimes counted as many as eleven, several of them, however, usually proving unproductive. The eggs measure, on an average, 3½ inches by 2½, are thick-shelled, rather smooth, and of a very dull yellowish-green colour. The period of incubation is twenty-eight days. They never have more than one brood in a season, unless their eggs are removed or broken at an early period.

The young follow their parents to the water a day or two after they have issued from the egg, but generally return to land to repose in the sunshine in the evening, and pass the night there under their mother, who employs all imaginable care to ensure their comfort and safety, as does her mate, who never leaves her during incubation for a longer time than is necessary for procuring food, and takes her place at intervals. Both remain with their brood until the following spring. It is during the breeding season that the gander displays his courage and strength to the greatest advantage. I knew one that appeared larger than usual, and of which all the lower parts were of a rich cream-colour. It returned three years in succession to a large pond a few miles from the mouth of Green river in Kentucky, and whenever I visited the nest, it seemed to look upon me with utter contempt. It would stand in a stately attitude, until I reached within a few yards of the nest, when suddenly lowering its head, and shaking it as if it were dislocated from the neck, it would open its wings, and launch into the air, flying directly at me. So daring was this fine fellow, that in two instances he struck me a blow with one of his wings on the right arm, which, for an

instant, I thought was broken. I observed that immediately after such an effort to defend his nest and mate, he would run swiftly towards them, pass his head and neck several times over and around the female, and again assume his attitude of defiance.

Always intent on making experiments, I thought of endeavouring to conciliate this bold son of the waters. For this purpose I always afterwards took with me several ears of corn, which I shelled, and threw towards him. It remained untouched for several days; but I succeeded at last, and before the end of a week both birds fed freely on the grain even in my sight! I felt much pleasure on this occasion, and repeating my visit daily, found, that before the eggs were hatched, they would allow me to approach within a few feet of them, although they never suffered me to touch them. Whenever I attempted this the male met my fingers with his bill, and bit me so severely that I gave it up. The great beauty and courage of the male rendered me desirous of obtaining possession of him. I had marked the time at which the young were likely to appear, and on the preceding day I baited with corn a large coop made of twine, and waited until he should enter. He walked in, I drew the string, and he was my prisoner. The next morning the female was about to lead her offspring to the river, which was distant nearly half a mile, when I caught the whole of the young birds, and with them the mother too, who came within reach in attempting to rescue one of her brood, and had them taken home. There I took a cruel method of preventing their escape, for with a knife I pinioned each of them on the same side, and turned them loose in my garden, where I had a small but convenient artificial pond. For more than a fortnight, both the old birds appeared completely cowed. Indeed, for some days I felt apprehensive that they would abandon the care of the young ones. However, with much attention, I succeeded in rearing the latter by feeding them abundantly with the larvæ of locusts, which they ate greedily, as well as with corn-meal moistened with water, and the whole flock, consisting of eleven individuals, went on prosperously. In December the weather became intensely cold, and I observed that now and then the gander would spread his wings, and sound a loud note, to which the female first, and then all the young ones in succession, would respond, when they would all run as far as the ground allowed them in a southerly direction, and attempt to fly off. I kept the whole flock three years. The old pair never bred while in my possession, but two pairs of the young ones did, one of them raising three, the other seven. They all bore a special enmity to dogs, and showed dislike to cats; but they manifested a still greater animosity towards an old Swan and a Wild Turkey-cock which I had. I found them useful in clearing the garden of slugs and snails; and although they now and then nipped the vegetables, I liked their com-

pany. When I left Henderson, my flock of Geese was given away, and I have not since heard how it has fared with them.

On one of my shooting excursions in the same neighbourhood, I chanced one day to kill a wild Canada Goose, which, on my return, was sent to the kitchen. The cook, while dressing it, found in it an egg ready for being laid, and brought it to me. It was placed under a common hen, and in due time hatched. Two years afterwards the bird thus raised, mated with a male of the same species, and produced a brood. This Goose was so gentle that she would suffer any person to caress her, and would readily feed from the hand. She was smaller than usual, but in every other respect as perfect as any I have ever seen. At the period of migration she showed by her movements less desire to fly off than any other I have known; but her mate, who had once been free, did not participate in this apathy.

I have not been able to discover why many of those birds which I have known to have been reared from the egg, or to have been found when very young and brought up in captivity, were so averse to reproduce, unless they were naturally sterile. I have seen several that had been kept for more than eight years, without ever mating during that period, while other individuals had young the second spring after their birth. I have also observed that an impatient male would sometimes abandon the females of his species, and pay his addresses to a common tame Goose, by which a brood would in due time be brought up, and would thrive. That this tardiness is not the case in the wild state I feel pretty confident, for I have observed having broods of their own many individuals which, by their size, the dulness of their plumage, and such other marks as are known to the practical ornithologist, I judged to be not more than fifteen or sixteen months old. I have therefore thought that in this, as in many other species, a long series of years is necessary for counteracting the original wild and free nature which has been given them; and indeed it seems probable that our attempts to domesticate many species of wild fowls, which would prove useful to mankind, have often been abandoned in despair, when a few years more of constant care might have produced the desired effect.

The Canada Goose, although immediately after the full development of its young it becomes gregarious, does not seem to be fond of the company of any other species. Thus, whenever the White-fronted Goose, the Snow Goose, the Brent Goose, or others, alight in the same ponds, it forces them to keep at a respectful distance; and during its migrations, I have never observed a single bird of any other kind in its ranks.

The flight of this species of Goose is firm, rather rapid, and capable of being protracted to a great extent. When once high in the air, they advance with extreme steadiness and regularity of motion. In rising from the water

or from the ground, they usually run a few feet with outspread wings; but when suddenly surprised and in full plumage, a single spring on their broad webbed feet is sufficient to enable them to get on wing. While travelling to some considerable distance, they pass through the air at the height of about a mile, steadily following a direct course towards the point to which they are bound. Their notes are distinctly heard, and the various changes made in the disposition of their ranks are easily seen. But although on these occasions they move with the greatest regularity, yet when they are slowly advancing from south to north at an early period of the season, they fly much lower, alight more frequently, and are more likely to be bewildered by suddenly formed banks of fog, or by passing over cities or arms of the sea where much shipping may be in sight. On such occasions great consternation prevails among them, they crowd together in a confused manner, wheel irregularly, and utter a constant cackling resembling the sounds from a disconcerted mob. Sometimes the flock separates, some individuals leave the rest, proceed in a direction contrary to that in which they came, and after awhile, as if quite confused, sail towards the ground, once alighted on which they appear to become almost stupified, so as to suffer themselves to be shot with ease, or even knocked down with sticks. This I have known to take place on many occasions, besides those of which I have myself been a witness. Heavy snow-storms also cause them great distress, and in the midst of them some have been known to fly against beacons and lighthouses, dashing their heads against the walls in the middle of the day. In the night they are attracted by the lights of these buildings, and now and then a whole flock is caught on such occasions. At other times their migrations northward are suddenly checked by a change of weather, the approach of which seems to be well known to them, for they will suddenly wheel and fly back in a southern direction several hundred miles. In this manner I have known flocks to return to the places which they had left a fortnight before. Nay, even during the winter months, they are keenly sensible to changes of temperature, flying north or south in search of feeding-grounds, with so much knowledge of the future state of the weather, that one may be assured when he sees them proceeding southward in the evening, that the next morning will be cold, and *vice versâ*.

The Canada Goose is less shy when met with far inland, than when on the sea-coast, and the smaller the ponds or lakes to which they resort, the more easy it is to approach them. They usually feed in the manner of Swans and fresh-water Ducks, that is, by plunging their heads towards the bottom of shallow ponds or the borders of lakes and rivers, immersing their fore parts, and frequently exhibiting their legs and feet with the posterior portion of their body elevated in the air. They never dive on such occasions. If

feeding in the fields or meadows, they nip the blades of grass sidewise, in the manner of the domestic Goose, and after rainy weather, they are frequently seen rapidly patting the earth with both feet, as if to force the earthworms from their burrows. If they dabble at times with their bills in muddy water, in search of food, this action is by no means so common with them as it is with Ducks, the Mallard for example. They are extremely fond of alighting in corn-fields covered with tender blades, where they often remain through the night and commit great havoc. Wherever you find them, and however remote from the haunts of man the place may be, they are at all times so vigilant and suspicious, that it is extremely rare to surprise them. In keenness of sight and acuteness of hearing, they are perhaps surpassed by no bird whatever. They act as sentinels towards each other, and during the hours at which the flock reposes, one or more ganders stand on the watch. At the sight of cattle, horses, or animals of the deer kind, they are seldom alarmed, but a bear or a cougar is instantly announced, and if on such occasions the flock is on the ground near water, the birds immediately betake themselves in silence to the latter, swim to the middle of the pond or river, and there remain until danger is over. Should their enemies pursue them in the water, the males utter loud cries, and the birds arrange themselves in close ranks, rise simultaneously in a few seconds, and fly off in a compact body, seldom at such times forming lines or angles, it being in fact only when the distance they have to travel is great that they dispose themselves in those forms. So acute is their sense of hearing, that they are able to distinguish the different sounds or footsteps of their foes with astonishing accuracy. Thus the breaking of a dry stick by a deer is at once distinguished from the same accident occasioned by a man. If a dozen of large turtles drop into the water, making a great noise in their fall, or if the same effect is produced by an alligator, the Wild Goose pays no regard to it; but however faint and distant may be the sound of an Indian's paddle, that may by accident have struck the side of his canoe, it is at once marked, every individual raises its head and looks intently towards the place from which the noise has proceeded, and in silence all watch the movements of their enemy.

These birds are extremely cunning also, and should they conceive themselves unseen, they silently move into the tall grasses by the margin of the water, lower their heads, and lie perfectly quiet until the boat has passed by. I have seen them walk off from a large frozen pond into the woods, to elude the sight of the hunter, and return as soon as he had crossed the pond. But should there be snow on the ice or in the woods, they prefer watching the intruder, and take to wing long before he is within shooting distance, as if

aware of the ease with which they could be followed by their tracks over the treacherous surface.

The Canada Geese are fond of returning regularly to the place which they have chosen for resting in, and this they continue to do until they find themselves greatly molested while there. In parts of the country where they are little disturbed, they seldom go farther than the nearest sandbank or the dry shore of the places in which they feed; but in other parts they retire many miles to spots of greater security, and of such extent as will enable them to discover danger long before it can reach them. When such a place is found, and proves secure, many flocks resort to it, but alight apart in separate groups. Thus, on some of the great sand-bars of the Ohio, the Mississippi, and other large streams, congregated flocks, often amounting to a thousand individuals, may be seen at the approach of night, which they spend there, lying on the sand within a few feet of each other, every flock having its own sentinel. In the dawn of next morning they rise on their feet, arrange and clean their feathers, perhaps walk to the water to drink, and then depart for their feeding-grounds.

When I first went to the Falls of the Ohio, the rocky shelvings of which are often bare for fully half a mile, thousands of Wild Geese of this species rested there at night. The breadth of the various channels that separate the rocky islands from either shore, and the rapidity of the currents which sweep along them, render this place of resort more secure than most others. The Wild Geese still betake themselves to these islands during winter for the same purpose, but their number has become very small; and so shy are these birds at present in the neighbourhood of Louisville, that the moment they are disturbed at the ponds where they go to feed each morning, were it but by the report of a single gun, they immediately return to their rocky asylums. Even there, however, they are by no means secure, for it not unfrequently happens that a flock alights within half gunshot of a person concealed in a pile of drifted wood, whose aim generally proves too true for their peace. Nay, I knew a gentleman, who had a large mill opposite Rock Island, and who used to kill the poor Geese at the distance of about a quarter of a mile, by means of a small cannon heavily charged with rifle bullets; and, if I recollect truly, Mr. TARASCON in this manner not unfrequently obtained a dozen or more Geese at a shot. This was done at dawn, when the birds were busily engaged in trimming their plumage with the view of flying off in a few minutes to their feeding-grounds. This war of extermination could not last long: the Geese deserted the fatal rock, and the great gun of the mighty miller was used only for a few weeks.

While on the water, the Canada Goose moves with considerable grace, and in its general deportment resembles the Wild Swan, to which I think it

is nearly allied. If wounded in the wing, they sometimes dive to a small depth, and make off with astonishing address, always in the direction of the shore, the moment they reach which, you see them sneaking through the grass or bushes, their necks extended an inch or so above the ground, and in this manner proceeding so silently, that, unless closely watched, they are pretty sure to escape. If shot at and wounded while on the ice, they immediately walk off in a dignified manner, as if anxious to make you believe that they have not been injured, emitting a loud note all the while; but the instant they reach the shore they become silent, and make off in the manner described. I was much surprised one day, while on the coast of Labrador, to see how cunningly one of these birds, which, in consequence of the moult, was quite unable to fly, managed for awhile to elude our pursuit. It was first perceived at some distance from the shore, when the boat was swiftly rowed towards it, and it swam before us with great speed, making directly towards the land; but when we came within a few yards of it, it dived, and nothing could be seen of it for a long time. Every one of the party stood on tiptoe to mark the spot at which it should rise, but all in vain, when the man at the rudder accidentally looked down over the stern and there saw the Goose, its body immersed, the point of its bill alone above water, and its feet busily engaged in propelling it so as to keep pace with the movements of the boat. The sailor attempted to catch it while within a foot or two of him, but with the swiftness of thought it shifted from side to side, fore and aft, until delighted at having witnessed so much sagacity in a *Goose*, I begged the party to suffer the poor bird to escape.

The crossing of the Canada Goose with the common domestic species has proved as advantageous as that of the wild with the tame Turkey, the cross breed being much larger than the original one, more easily raised, and more speedily fattened. This process is at present carried on to a considerable extent in our Western and Eastern States, where the hybrids are regularly offered for sale during autumn and winter, and where they bring a higher price than either of the species from which they are derived.

The Canada Goose makes its first appearance in the western country, as well as along our Atlantic coast, from the middle of September to that of October, arriving in flocks composed of a few families. The young birds procured at this early season soon get into good order, become tender and juicy, and therefore afford excellent eating. If a sportsman is expert and manages to shoot the old birds first, he is pretty sure to capture the less wily young ones afterwards, as they will be very apt to return to the same feeding places to which their parents had led them at their first arrival. To await their coming to a pond where they are known to feed is generally effectual, but to me this mode of proceeding never afforded much pleasure,

more especially because the appearance of any other bird which I wished to obtain would at once induce me to go after it, and thus frighten the game, so that I rarely procured any on such occasions. But yet, as I have witnessed the killing of many a fine Goose, I hope you will suffer me to relate one or two anecdotes connected with the shooting of this kind of game.

Reader, I am well acquainted with one of the best sportsmen now living in the whole of the western country, one possessed of strength, activity, courage, and patience,—qualities of great importance in a gunner. I have frequently seen him mount a capital horse of speed and bottom at midnight, when the mercury in the thermometer was about the freezing point, and the ground was covered with snow and ice, the latter of which so encased the trees that you might imagine them converted into glass. Well, off he goes at a round gallop, his steed rough shod, but nobody knows whither, save myself, who am always by his side. He has a wallet containing our breakfast, and abundance of ammunition, together with such implements as are necessary on occasions like the present. The night is pitch-dark, and dismal enough; but who cares! *He* knows the woods as well as any Kentucky hunter, and in this respect I am not much behind him. A long interval has passed, and now the first glimpse of day appears in the east. We know quite well where we are, and that we have travelled just twenty miles. The Barred Owl alone interrupts the melancholy silence of the hour. Our horses we secure, and on foot we move cautiously towards a "long pond," the feeding-place of several flocks of Geese, none of which have yet arrived, although the whole surface of open water is covered with Mallards, Widgeons, Pin-tail Ducks, Blue-winged and Green-winged Teals. My friend's gun, like mine, is a long and trusty one, and the opportunity is too tempting. On all fours we cautiously creep to the very edge of the pond; we now raise ourselves on our knees, level our pieces, and let fly. The woods resound with repeated echoes, the air is filled with Ducks of all sorts, our dogs dash into the half frozen water, and in a few minutes a small heap of game lies at our feet. Now, we retire, separate, and betake ourselves to different sides of the pond. If I may judge of my companion's fingers by the state of my own, I may feel certain that it would be difficult for him to fasten a button. There we are shivering, with contracted feet and chattering teeth; but the Geese are coming, and their well known cry, *hauk, hauk, awhawk, awhawk,* resounds through the air. They wheel and wheel for awhile, but at length gracefully alight on the water, and now they play and wash themselves, and begin to look about for food. There must be at least twenty of them. Twenty more soon arrive, and in less than half an hour we have before us a flock of a hundred individuals. My experienced friend has put a snow-white shirt over his apparel, and although I am greatly intent on observing

his motions, I see that it is impossible even for the keen eye of the sentinel Goose to follow them. Bang, bang, quoth his long gun, and the birds in dismay instantly start, and fly towards the spot where I am. When they approach I spring up on my feet, the Geese shuffle, and instantaneously rise upright; I touch my triggers singly, and broken-winged and dead two birds came heavily to the ground at my feet. Oh that we had more guns! But the business at this pond has been transacted. We collect our game, return to our horses, fasten the necks of the Geese and Ducks together, and throwing them across our saddles, proceed towards another pond. In this manner we continue to shoot until the number of Geese obtained would seem to you so very large that I shall not specify it.

At another time my friend proceeds alone to the Falls of the Ohio, and, as usual, reaches the margins of the stream long before day. His well-trained steed plunges into the whirls of the rapid current, and, with some difficulty, carries his bold rider to an island, where he lands drenched and cold. The horse knows what he has to do as well as his master, and while the former ranges about and nips the frozen herbage, the latter carefully approaches a well-known pile of drifted wood, and conceals himself in it. His famous dog Nep is close at his heels. Now the dull grey dawn gives him a dim view of the Geese; he fires, several fall on the spot, and one severely wounded rises and alights in the Indian Chute. Neptune dashes after it, but as the current is powerful, the gunner whistles to his horse, who, with pricked ears, gallops up. He instantly vaults into the saddle, and now see them plunge into the treacherous stream. The wounded game is overtaken, the dog is dragged along, and at length on the Indiana shore the horse and his rider have effected a landing. Any other man than he of whose exploits I am the faithful recorder, would have perished long ago. But it is not half so much for the sake of the game that he undergoes all this labour and danger, as for the gratification it affords his kind heart to distribute it among his numerous friends in Louisville.

On our eastern shores matters are differently managed. The gunners there shoot Geese with the prospect of pecuniary gain, and go to work in another way. Some attract them with wooden geese, others with actual birds; they lie in ambush for many hours at a time, and destroy an immense number of them, by using extremely long guns; but as there is little sport in this sort of shooting, I shall say no more about it. Here the Canada Goose feeds much on a species of long slender grass, the *Zostera marina*, along with marine insects, crustacea, and small shell-fish, all of which have a tendency to destroy the agreeable flavour which their flesh has when their food consists of fresh-water plants, corn, and grass. They spend much of their time at some distance from the shores, become more shy, diminish in

bulk, and are much inferior as food to those which visit the interior of the country. None of these, however, are at all to be compared with the goslings bred in the inland districts, and procured in September, when, in my opinion, they far surpass the renowned Canvass-backed Duck.

A curious mode of shooting the Canada Goose I have practised with much success. I have sunk in the sand of the bars to which these birds resort at night, a tight hogshead, to within an inch of its upper edges, and placing myself within it at the approach of evening, have drawn over me a quantity of brushwood, placing my gun on the sand, and covering it in like manner with twigs and leaves. The birds would sometimes alight very near me, and in this concealment I have killed several at a shot; but the stratagem answers for only a few nights in the season. During severe winters these birds appear to be able to keep certain portions of the deepest part of a pond quite open and free from ice, by their continued movements in the water; at all events, such open spaces occasionally occur in ponds and lakes, and are resorted to by the Geese, among which great havoc is made.

While we were at Newfoundland, on our return from Labrador, on the 15th August, 1833, small flocks of the Canada Goose were already observed flying southward. In that country their appearance is hailed with delight, and great numbers of them are shot. They breed rather abundantly by the lakes of the interior of that interesting country. In the harbour of Great Macatina in Labrador, I saw a large pile of young Canada Geese, that had been procured a few days before, and were already salted for winter use. The pile consisted of several hundred individuals, all of which had been killed before they were able to fly. I was told there that this species fed much on the leaves of the dwarf firs, and, on examining their gizzards, found the statement to be correct.

The young dive very expertly, soon after their reaching the water, at the least appearance of danger. In the Southern and Western States, the enemies of the Canada Goose are, by water, the alligator, the garfish, and the turtle; and on land, the cougar, the lynx, and the racoon. While in the air, they are liable to be attacked by the White-headed Eagle. It is a very hardy bird, and individuals have been kept in a state of captivity or domestication for upwards of forty years. Every portion of it is useful to man, for besides the value of the flesh as an article of food, the feathers, the quills, and the fat, are held in request. The eggs also afford very good eating.

CANADA GOOSE, *Anas canadensis*, Wils. Amer. Orn., vol. viii. p. 52.

ANSER CANADENSIS, Bonap. Syn., p. 377.

ANSER CANADENSIS, *Canada Goose*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 468.

CANADA GOOSE, Nutt. Man., vol. ii. p. 349.

CANADA GOOSE, *Anser canadensis*, Aud. Orn. Biog., vol. iii. p. 1; vol. v. p. 607.

Male, 43, 65. Female, 41.

Breeds sparingly from the Mississippi to Nova Scotia; abundantly in Labrador, and farther north. In the interior, on the Missouri, and across to the Columbia river. Abundant. Migrates far south in winter.

Adult Male.

Bill shorter than the head, rather higher than broad at the base, somewhat conical, depressed toward the end, rounded at the tip. Upper mandible with the dorsal line sloping, the ridge broad and flattened, the sides sloping, the edges soft and obtuse, the oblique marginal lamellæ short, transverse, about thirty on each side; the unguis obovate, convex, denticulate on the inner edge. Nasal groove oblong, parallel to the ridge, filled by the soft membrane of the bill; nostrils medial, lateral, longitudinal, narrow-elliptical, open, pervious. Lower mandible straight, with the angle very long, narrow, and rounded, the edges soft and obtuse, with about thirty oblique lamellæ on a perpendicular plane.

Head small, oblong, compressed. Neck long and slender. Body full, slightly depressed. Feet short, stout, placed behind the centre of the body; legs bare a little above the tibio-tarsal joint; tarsus short, a little compressed, covered all round with angular reticulated scales, which are smaller behind; hind toe very small, with a narrow membrane; third toe longest, fourth a little shorter, but longer than second; all the toes reticulated above at the base, but with narrow transverse scutella towards the end; the three anterior connected by a reticulated membrane, the outer with a thick margin, the inner with the margin extended into a two-lobed web; claws small, arched, rather compressed, except that of the middle toe, which is bent obliquely outwards and depressed, with a curved edge. Wings of moderate length, with an obtuse protuberance at the flexure.

Plumage close, rather short, compact above, blended on the neck and lower parts of the body. The feathers of the head and neck very narrow, of the back very broad and abrupt, of the breast and belly broadly rounded. Wings, when closed, extending to about an inch from the end of the tail, acute; primaries very strong, curved, the second longest, the third slightly shorter, the first almost as long as the third, the rest rapidly graduated; secondaries long, rather narrow, rounded. Tail very short, rounded, of eighteen stiff, rounded, but acuminate, feathers.

Bill, feet, and claws black. Iris chestnut-brown. Head and two upper thirds of the neck glossy black; forehead, cheeks, and chin tinged with brown; lower eyelid white; a broad band of the same across the throat to

behind the eyes; rump and tail-feathers also black. The general colour of the rest of the upper parts is greyish-brown, the wing coverts shaded into ash-grey; all the feathers terminally edged with very pale brown; the lower part of the neck passing into greyish-white, which is the general colour of the lower parts, with the exception of the abdomen, which is pure white, the sides, which are pale brownish-grey, the feathers tipped with white, and the lower wing-coverts, which are are also pale brownish-grey. The margins of the rump and the upper tail-coverts, pure white.

In very old males, I have found the breast of a fine pale buff.

Length to end of tail 43 inches, extent of wings 65; bill along the ridge $2\frac{1}{2}$, in depth at the base $1\frac{2}{8}$, in breadth 1; tarsus $3\frac{7}{8}$; middle toe and claw $4\frac{1}{4}$; wing from flexure 20; tail $7\frac{1}{4}$. Weight 7 lbs.

Adult Female.

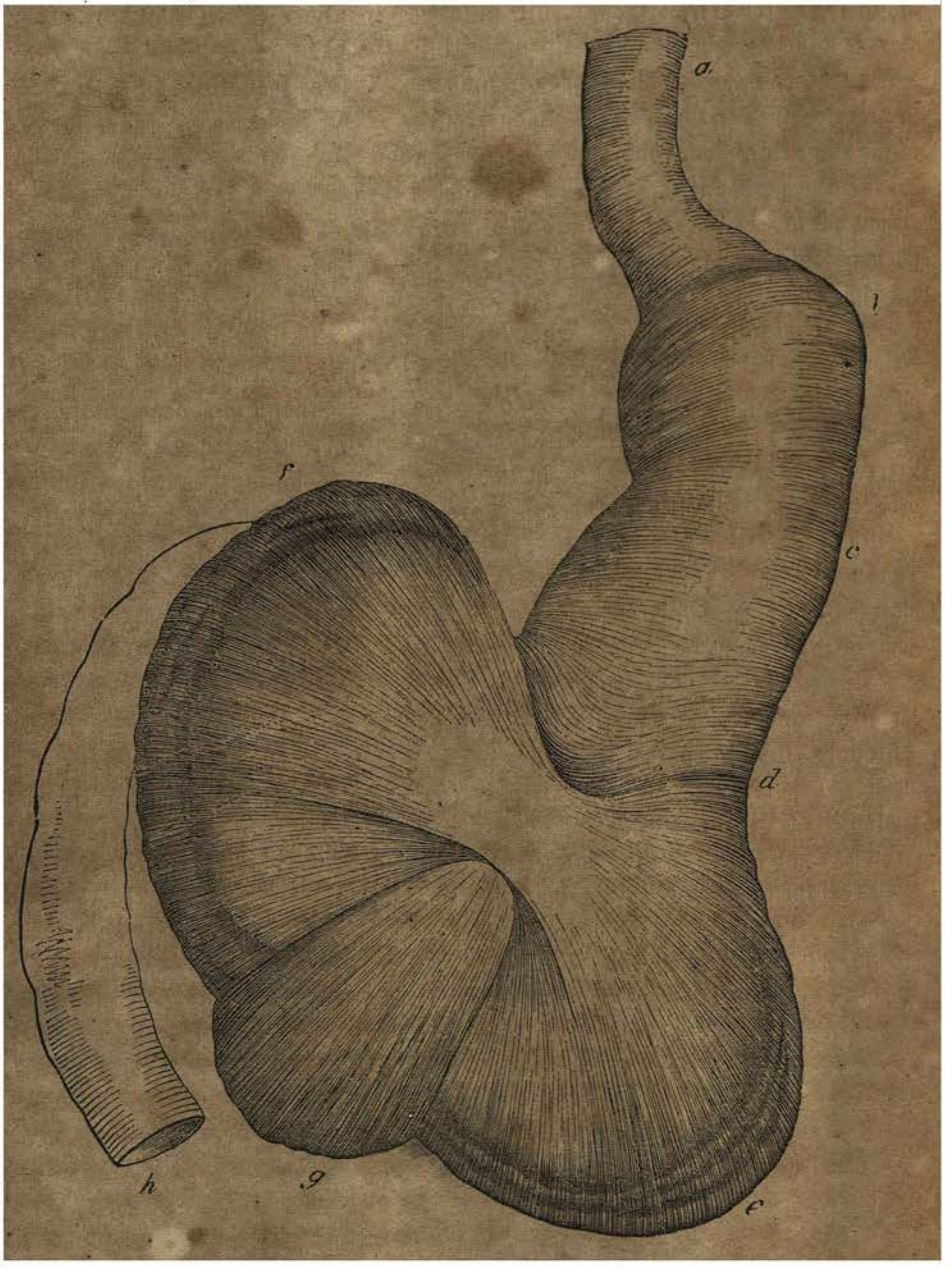
The female is somewhat less than the male, but similar in colouring, although the tints are duller. The white of the throat is tinged with brown; the lower parts are always more grey, and the black of the head, neck, rump, and tail, is shaded with brown.

Length 41 inches. Weight $5\frac{3}{4}$ lbs.

Male, presented by Dr. T. M. Brewer of Boston. The mouth is 1 inch 2 twelfths in width; the anterior part of its roof, which is concave, is beautifully marked with a middle tuberculated ridge, two lateral ridges of lamelliform tubercles, and between them a number of irregularly dispersed tubercles, besides the lateral lamellæ properly so called, of which there are 38 on each side; the lamellæ of the lower mandible are 50. The tongue is $2\frac{1}{4}$ inches long, fleshy, with a deep median groove, a lateral series of small, tapering, acute, reversed papillæ, and a semicircular tip, having a very thin horny edge. The posterior aperture of the nares is oblongo-linear, $1\frac{1}{4}$ inches in length. The œsophagus, *a b c d*, is 22 inches long; for 12 inches its width is only 9 twelfths, but on entering the thorax it expands, at *b*, to $1\frac{5}{12}$ inches, then contracts a little, in the proventricular portion, *c d*, again enlarges to $1\frac{1}{2}$ inches, and finally to $1\frac{4}{12}$ inches. The stomach, *d e f g*, is an extremely developed gizzard, of a transversely elliptical form, placed obliquely, $4\frac{1}{2}$ inches in breadth, 2 inches 10 twelfths in length; the left muscle 1 inch 9 twelfths thick, the right 2 inches; the epithelium forms two transversely elliptical, concave, grinding surfaces, of great density (but is altogether wanting on the rest of the inner surface, although this may have happened after death). The proventricular glands are very small, cylindrical, $2\frac{1}{2}$ twelfths in length, and form a belt 2 inches in breadth. The duodenum curves at the distance of 8 inches, and there are formed 12 folds by the intestine, which is 10 feet in length, 10 twelfths in width at the upper part, afterwards $7\frac{1}{2}$ twelfths, until towards the rectum, when it

enlarges to 9 twelfths. The cœca are 9½ inches long, 7 twelfths in their greatest width, but only 2 twelfths at the commencement, their extremity narrow but obtuse. The rectum is 8½ inches long; there is no remarkable cloacal enlargement.

The sternum is very similar to that of a swan; its length 6½ inches, its



breadth at the anterior costal processes 3 inches; the height of the crest 1 inch 10 twelfths. The liver is small, the left lobe, which is 3 inches in length, covering but a very small portion of the stomach; the right lobe is 5 inches in length; the gall-bladder 2 inches 9 twelfths in length, 8 twelfths in breadth, but contracted to 3 twelfths at the distance of 10 twelfths from the extremity, where it enlarges to about 5 twelfths. The heart is 3 inches long, 2¼ inches in breadth at the base.

The trachea measures 20½ inches in length. At first it inclines a little to the left side, then on the anterior concave curve of the neck passes gradually to the right side, along which it proceeds as far as the lower part of the convex curve, when it separates in front from the neck, and forms a loop or abrupt curve, which is attached to the anterior part of the sternum, between the coracoid bones, thus approximating to the trachea of the Swans, but not entering the crest of the sternum. It then passes directly along the spine to behind the middle of the heart, where it bifurcates. In this respect also it is singular, in being more elongated than in the other species, of which the bifurcation is considerably anterior to the heart. At the commencement its breadth is 6 twelfths; presently after it enlarges to 8 twelfths, then contracts to 6 twelfths, and so continues until it begins to form the loop, on which its breadth is again 8 twelfths; after this it gradually tapers, so as to be only 2½ twelfths wide at the inferior larynx, where its depth, however, is 5 twelfths. The form of that part is much the same as in the Swans, there being a similar elevated, bony, curved edge on each side, projecting beyond the commencement of the membrane of the bronchus, which is ½ inch in length before the first ring appears. These membranes form a pretty large sac of a triangular form; and the continuation of the bronchus is extremely diminutive, with only 10 very small and slender cartilaginous half rings. The lateral muscles are large; their anterior part gives off the sterno-tracheal at the distance of 2¼ inches from the inferior larynx; but the posterior part, which is much larger, runs down 1 inch farther, and then terminates in a pointed form, not extending so far as to constitute an inferior laryngeal muscle. The rings of the trachea are broad, very firm, considerably flattened, 220 in number.

HUTCHINS'S GOOSE.

ANSER HUTCHINSII, *Richardson.*

PLATE CCCLXXVII.—ADULT.

Although it was not my good fortune while in the State of Maine, or on the coast of Labrador, to meet with this bird, I have no doubt that its periodical appearance along our eastern coast will ere long be fully established. This is the more to be expected as Dr. RICHARDSON informs us that it is abundant about Hudson's Bay, where it was long mistaken for the Brent, or an emaciated Canada Goose. In the mean time, having been presented with a specimen by my highly esteemed and gallant friend Captain JAMES CLARK ROSS, I have embraced the opportunity thus offered, of laying before you a representation, the first I believe that has yet appeared, of HUTCHINS' Goose.

For fifteen months, rendered trebly long and wearisome by heavy and difficult marches, under the most distressing feelings, that most amiable and accomplished traveller carried with him many specimens of rare birds, with the view of contributing to the advancement of our knowledge. Would, reader, that you could sympathize with me in the feelings of pride and pleasure with which I call him friend. May his name be as extensively known as his worth deserves!

Some weeks after my drawing was finished, and when I had arrived in Edinburgh, I had the gratification of receiving a long and most interesting letter from him, of which I present you with an extract. "I have very great pleasure in having it now in my power to offer to your acceptance the specimen of this interesting species from which your drawing was taken. It was the child of my solicitude, and my constant companion during a long and tedious journey, after the abandonment of our ship, until our being received on board the Isabella, an interval of fifteen months; and this will account in a great measure for the miserable plight in which the specimen first came into your hands. I will dispose of it according to your wishes, and am most happy to place it in the hands of one who knows so well how to appreciate the interesting associations connected with it.

"These birds arrived in flocks about the middle of June, in the neighbourhood of Felix Harbour, and soon dispersed in pairs to their breeding place.

Hutchins's Goose

Adult Male

Drawn from Nature by J.J. Audubon F.R.S.E.L.S. Lith.d Printed & Col.d by J.T. Bowen, Phila.a

At Igloolik, the only place where we had before met with them, their nests were found in the marshes near the sea; but on this occasion several pairs constructed their nests on a ledge of rock near the foot of a high precipice; immediately above them the Dovekies, Loons, several species of Gulls, and near its summit, the Jer-Falcon and Raven, built their nests.

"From three to four eggs were found in each nest, of a pure white, and of an oval form, measuring 3.1 inch by 2.1, and weighing from 1800 to 2000 grains.

"The female bird is smaller than the male. To the measurements given by Dr. RICHARDSON, which are very accurate, we may add that its extent of wings is fifty inches, and that it averages about four pounds and a half of weight. Its flesh is of a most exquisite flavour."

ANSER HUTCHINSII, *Hutchins' Bernacle Goose*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 470.

HUTCHINS' GOOSE, *Anser Hutchinsii*, Aud. Orn. Biog., vol. iii. p. 526.

Adult, 25, 50.

Breeds in the Arctic Regions. Columbia river. Abundant.

Adult.

Bill shorter than the head, higher than broad at the base, somewhat conical, depressed towards the end, rounded at the tip. Upper mandible with the dorsal line sloping, the ridge slightly flattened at the base, convex in the rest of its extent, the sides sloping, the edges soft, the oblique internal lamellæ about thirty; the unguis roundish, convex. Nasal groove oblong, parallel to the ridge, filled by the soft membrane of the bill; nostrils medial, lateral, longitudinal, narrow-elliptical, open, pervious. Lower mandible straight, with the angle very long, narrow and rounded, the edges with about forty oblique lamellæ.

Head small, oblong, compressed. Neck long and very slender. Body full. Feet short, stout, placed behind the centre of the body; legs bare a little above the joint; tarsus short, a little compressed, covered all round with angular scales, those behind smaller; hind toe very small. with a narrow membrane, third the longest, fourth considerably shorter, but longer than second; all reticulated above at the base, but with narrow transverse scutella towards the end; the three anterior connected by reticulated webs, the outer with a thick margin, the inner with the edge more dilated. Claws small, arched, rather compressed, except that of the middle toe, which is bent obliquely inwards and depressed, with a curved edge.

Plumage close, blended on the neck and lower parts of the body, compact on the upper. The feathers of the head and neck very narrow, of the back

very broad and abrupt, of the breast and belly broadly rounded. Wings long; primaries strong, curved, the second longest, but the first and third almost as long, the rest rapidly graduated; secondaries long, rather narrow, rounded. Tail short, slightly rounded, of sixteen rounded feathers.

Bill, feet, and claws black. Iris brown. Head and two upper thirds of the neck glossy black. A large subtriangular patch of white on each side of the head and neck. The general colour of the upper parts is brownish-grey, the feathers margined with paler; of the lower parts pale greyish-brown, margined with yellowish-grey; the abdomen and lower tail-coverts white; the hind part of the back brownish-black. The primary quills and tail-feathers are deep brown.

Length to end of tail 25 inches, extent of wings 50; wing from flexure 16¾; tail 5¾; bill along the back 1½, along the edge of lower mandible 1½; tarsus 2½; middle toe 2, its claw ⅜. Weight 4½ lbs.

In the Fauna Boreali-Americana, the tail-feathers are stated to be fourteen. In my specimen they are sixteen, and it is probable that the full number is eighteen, as the two middle ones seem to be wanting.

THE BERNACLE GOOSE.

ANSER LEUCOPSIS, *Bechst.*

PLATE CCCLXXVIII.—MALE AND FEMALE.

Several old gunners on the coast of Massachusetts and Maine, who were Englishmen by birth, assured me that they had killed Bernacles there, and that these birds brought a higher price in the markets than the Common Brent Geese. The Prince of Musignano states in his Synopsis that they are very rare and accidental in the United States, and Mr. NUTTALL says that they are "mere stragglers" there. For my part, I acknowledge that I never met with one of them, either along the coast or in the interior, although I have seen beautiful mounted specimens in various parts. Being neither anxious to add to our Fauna, nor willing unnecessarily to detract from it, I have figured a pair of these birds, with the hope that ere long, the assertions of the gunners, and those of the authors above mentioned, may be abundantly

Bernacle Goose

1. Male 2. Female.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Phila.d

verified by the slaughter of many Geese. In the meantime I must further confess my ignorance of the habits of the Bernacle.

Mr. SELBY thus speaks of it in the second volume of his Illustrations:—"The Bernicle is amongst the number of our winter visitants, annually resorting in vast numbers, upon the approach of autumn, to the western shores of Britain, and to the north of Ireland. Upon the Lancashire coast, the Solway Frith, &c., it is very abundant; frequenting the marshy grounds that are occasionally covered by the spring tides, and such sands as produce the sea-grasses and plants upon which it feeds. Upon the eastern and southern shores of Britain it is of rare occurrence, its place being supplied by its nearly allied congener, the Brent Goose (*Anser Brenta*); which again is as rarely seen upon the opposite coast of the island. Like the rest of the genus, the Bernicle is a very wary bird, and can only be approached by the most cautious manœuvres. It is sometimes shot by moonlight, when it comes on the sands to feed, by persons couched on the ground, or from behind any occasional shelter in such places as the flocks are known to frequent. Its flesh is sweet and tender, and highly esteemed for the table. Upon the approach of spring it leaves our shores for more northern countries, and by the middle of March the whole have retired." It is known to breed in Iceland, Spitzbergen, Greenland, &c. as well as in Lapland, the northern parts of Russia, and northern Asia. It also inhabits Hudson's Bay and other polar districts of the American continent. During its equatorial or winter migration, it is abundant in Holland, France, and parts of Germany.

The eggs, which I describe from specimens deposited in the rich Museum of the University of Edinburgh, measure two inches and seven-eighths by one inch and seven-eighths, and are of a uniform yellowish-cream colour.

I have represented an adult male in spring, and a female of the preceding year.

ANSER LEUCOPSIS, Bonap. Syn., p. 377.
BERNACLE GOOSE, Nutt. Man., vol. ii. p. 355.
BERNACLE GOOSE, *Anser leucopsis*, Aud. Orn. Biog., vol. iii. p. 609.

Male, 27, 56. Female, 23½, 52.
Accidental in North America.
Adult Male in Spring.

Bill much shorter than the head, higher than broad at the base, somewhat conical, slightly depressed towards the end, narrowed and rounded at the tip. Upper mandible with the dorsal line sloping, the ridge broad and flattened, the sides sloping, the edges soft and obtuse, the oblique marginal lamellæ short, transverse, about thirty on each side, besides minute anterior ones;

the unguis roundish, convex, striato-denticulate on the inner edge. Nasal groove elliptical, commencing at the base and extending to the middle of the bill, parallel to the ridge, filled by the soft membrane of the bill; nostrils lateral, submedial, longitudinal, narrow-elliptical, open, pervious. Lower mandible straight, with the angle very long, rather wide, and rounded, the sides sloping rapidly upwards, the edges soft and obtuse, with about thirty-eight distinct lamellæ on an inflected plane.

Head small, oblong, compressed. Neck rather long and slender. Body full, slightly depressed. Feet short, stout, placed a little behind the centre of the body; legs bare a little above the tibio-tarsal joint. Tarsus short, a little compressed, covered all round with angular reticulated scales, which are smaller behind. Hind toe extremely small, with a very narrow membrane; third toe longest, fourth a little shorter, but longer than second; all the toes reticulated above at the base, but with narrow transverse scutella towards the end; the three anterior connected by a reticulated membrane, the outer with a thick margin, the inner with the margin extended into a two-lobed web. Claws small, arched, rather compressed, except that of the middle toe, which is bent obliquely outwards, depressed, with a curved edge. Wings of moderate length, with an obtuse protuberance at the flexure.

Plumage close, rather short, compact above, blended on the head, neck, and lower parts of the body. The feathers of the head and neck very narrow, of the back very broad and abrupt, of the breast and belly broadly rounded. Wings when closed extending about an inch and a quarter beyond the tail, acute; primaries very strong, curved, the second longest; secondaries long, broad, rounded. Tail very short, rounded, of sixteen stiff rounded and acuminate feathers.

Bill, feet, and claws black. Iris dark hazel. Anterior part of the head, including a broad space above the eye, the sides of the head, and the throat, white; the feathers margining the bill, and a line from the bill to the eye, curving below the lower eyelid, and running along the upper, brownish-black. Neck all round glossy black, of which colour are the anterior or dorsal feathers, the scapulars, and the wing-coverts, towards their extremities, while their bases are ash-grey, and their terminal margins white. The shorter feathers on the middle of the back are similar; those on the rump and the tail feathers deep black. The quills are greyish-black, darker towards the tips, the outer webs more or less tinged with ash-grey. The breast, sides, and abdomen greyish-white, the upper feathers of the sides with more grey; the upper and lower tail-coverts, and the sides of the rump, pure white.

Length 27 inches, extent of wings 4 feet 8 inches; bill along the ridge 1½, in depth at the base $\frac{10}{12}$, in breadth $\frac{9}{12}$; tarsus $2\frac{10}{12}$, middle toe and claw $2\frac{11}{12}$;

Nº 76.
Pl. 379.
Brant Goose
1. Male 2. Female
Drawn from Nature by J.J. Audubon, FRSFLS

wing from flexure 17 ; tail 6 ; the feet extend beyond the tail 3½ inches. Weight 4 lbs. 1 oz.

Adult Female.

The female, which is much smaller, has the same colours, the black parts being tinged with brown, and the tints generally duller.

Length 23½ inches, extent of wings 4 feet 4 inches ; the feet extend beyond the tail 2½ inches. Weight 2 lbs. 9 oz.

BRENT GOOSE.

ANSER BERNICLA, *Linn.*

PLATE CCCLXXIX.—MALE AND FEMALE.

The extent of the migrations of this species remains as yet unknown. Its progress along our Atlantic shores in October, November, and December, is varied, and in a great measure uncertain, it being apparently induced to tarry or to proceed by the changes which may happen in the temperature. It in fact appears to remain along the coast until forced away by the intensity of the cold, when it resumes its flight, and removes to countries beyond the southern limits of the United States.

The Brent Goose may be considered as a salt-water bird, for it never ascends our rivers beyond the influence of the tides, nor is found on inland lakes or ponds, unless it be wounded, and happen to alight accidentally in such places. To this natural predilection for salt-water may be attributed its habit of flying round the projections of capes and headlands : it very seldom passing directly over a neck of land, unless suddenly surprised and alarmed by the gunner.

This species has never been seen by my friend Dr. BACHMAN in South Carolina. I never observed any on the lakes or shores about the mouths of the Mississippi, nor any where in the course of my route to Texas. While I was in that country, I did not find any person who could give me sufficient reasons for believing that it ever tarries there. Where it may go in winter is therefore to me unknown.

The flesh of this bird I consider as excellent food. The young in autumn,

or about the time of their first appearance on our eastern coast, Massachusetts for example, are tender, juicy, and fat; and are as well known to the epicures of Boston as the more celebrated Canvass-back is to those of Baltimore.

Its flight resembles that of our other Geese, being in ordinary circumstances rather slow and sedate. As to its cry, although I have often seen hundreds of individuals at a time, I have not been able to tune my ears so as to liken its cacklings to the sounds produced by "a pack of hounds in full cry," as alleged by WILSON. The Brent Goose is a shy bird, not easily approached; it swims well, and when wounded can dive with great expertness, as I have more than once witnessed. Its food consists of marine plants, which I have often found in its gizzard, along with coarse gravel and fragments of shells, which latter were so thick as to lead me to think that the bird had not broken them for the purpose of getting at the animal. In walking it moves with lighter and quicker steps than even the Bernacle Goose, *Anser leucopsis*. It is very easily tamed, and when thus subjugated eats any kind of grain, and crops the grass well with its head slightly inclined to one side. It has been known to produce young in captivity.

Of its manner of breeding I am ignorant; and all that has been stated on the subject is, that it breeds in great numbers in northern latitudes, for example, on the coasts and islands of Hudson's Bay and the Arctic Sea, and that it lays white eggs.

I have represented a pair which were shot in spring, when their migratory movements are more regular than in autumn.

"A few years ago," Mr. THOMAS MACCULLOCH writes to me, "a Brent Goose, slightly wounded in the tip of the wing, was brought us, but it rejected sea-grass and every thing else which was offered it, and died in a few days after it came into our possession. Shortly after we procured another which had been disabled in the same manner. Like the first it rejected every thing but water, and would certainly soon have shared the fate of its predecessor, had not my mother thrown a handful of unshelled barley into the tub of water, in which it was accustomed to swim. The grain was immediately devoured by the bird, with as much avidity as if it had been its usual fare; and during the time it remained with us, it would taste no other food. It having recovered the use of its wing, we usually placed it at night, for greater security, in a room near the one in which the man-servant slept. This arrangement, however, did not prove agreeable to all the parties concerned. Though the Brent was perfectly silent, yet the disposition for early rising which it evinced by pattering about the floor sorely disturbed the Irishman's predilection for a lengthened nap. To relieve himself from the annoyance, early one morning, when he thought there was no danger of detection, he let the bird free. It, however, no

sooner found itself loose than it began to exult most loudly in its liberty, and my mother, who was awakened by the singular and unusual noise, rose and lifted the blind, just as it took wing for the water, where doubtless it soon rejoined its former companions. The time it was in our possession was too short to admit of many observations being made on its habits. We remarked, however, that it was by no means deficient in courage. When approached, it would lower its head, writhe its glossy serpent-like neck, and, with open mouth, protruded tongue, and eyes flashing with rage, prepare to defend itself, emitting at the same time a strong hissing sound. This was the only noise which it made while in our possession, and until the morning of its departure it was never heard to use the hoarse call of the species."

Brant, *Anas Bernicla*, Wils. Amer. Orn., vol. viii. p. 131.
Anser Bernicla, Bonap. Syn., p. 378.
Anser Bernicla, *Brent Goose*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 469.
Brant or Brent Goose, Nutt. Man., vol. ii. p. 358.
Brent Goose, *Anser Bernicla*, Aud. Orn. Biog., vol. v. pp. 24, 610.

Male, 24½, 48. Female, 23, 44½.

Abundant along the coast of the Atlantic, from Maine to Maryland, during winter. Never seen far inland. Breeds from Labrador northward. Columbia river.

Adult Male.

Bill much shorter than the head, higher than broad at the base, somewhat conical, slightly depressed toward the end, narrowed and rounded at the tip. Upper mandible with the dorsal line sloping, the ridge a little flattened at the base, convex toward the end, the sides sloping, the edges soft, the oblique marginal lamellæ short, transverse, about 25 on each side, the unguis round, convex, striato-denticulate on the inner edge. Nasal groove elliptical, commencing at the base, and extending to beyond the middle of the bill; nostrils lateral, medial, longitudinal, narrow-elliptical, open, pervious. Lower mandible straight, depressed, with the angle very long, rather wide, somewhat rounded, the sides sloping outwards, the edges soft, with about forty lamellæ.

Head small, oblong, compressed. Neck rather long and slender. Body full, slightly depressed. Feet short, stout, placed a little behind the centre of the body; legs bare a little above the tibio-tarsal joint. Tarsus short, compressed, covered all round with angular reticulated scales, which are smaller behind. Hind toe extremely small, with a very narrow membrane; third toe longest, fourth a little shorter, but longer than the second; all the toes reticulated above at the base, but with narrow transverse scutella towards the end; the three anterior connected by a reticulated membrane;

the outer with a thick margin, the inner with the margin extended into a two-lobed web. Claws small, arched, rather depressed, especially that of the middle toe, which has the inner margin expanded.

Plumage close, rather short, compact above, blended on the head, neck, and lower parts of the body. The feathers of the head and neck small and oblong, of the back very broad and abruptly rounded, of the breast and belly broadly rounded. Wings, when closed, extending a little beyond the end of the tail; primaries very strong, decurved, the first longest, the second almost equal; secondaries long, broad, rounded. Tail very short, rounded, of sixteen feathers.

Bill and feet black. Iris hazel. Head and neck all round black, glossed with blue. A small streak under the eye, and a spot on the chin, white; on each side of the neck a patch of the same formed by a number of the feathers which have a white band near the end. The general colour of the upper parts is brownish-grey, the feathers terminally margined with light greyish-brown; the quills, and primary coverts greyish-black, the primaries darker; the upper tail-coverts white, the tail greyish-black. The fore part of the breast is light brownish-grey, the feathers terminally margined with greyish-white; the grey tint gradually fades into white, which is the colour of the abdomen, sides of the rump and lower tail-coverts; the sides of the body grey, the feathers broadly tipped with white; axillar feathers and lower wing-coverts grey.

Length to end of tail 24½ inches, to end of claws 25½; extent of wings 48; bill along the ridge $1\frac{4}{12}$, along the edge of lower mandible $1\frac{4}{12}$; *wing from* flexure 13; tail 4½; tarsus 1¼; *hind toe* $\frac{3}{12}$, *its claw* $\frac{3}{12}$; *middle toe* $1\frac{8}{12}$, *its* claw $\frac{4}{12}$. Weight 3¼ lbs.

Adult Female.

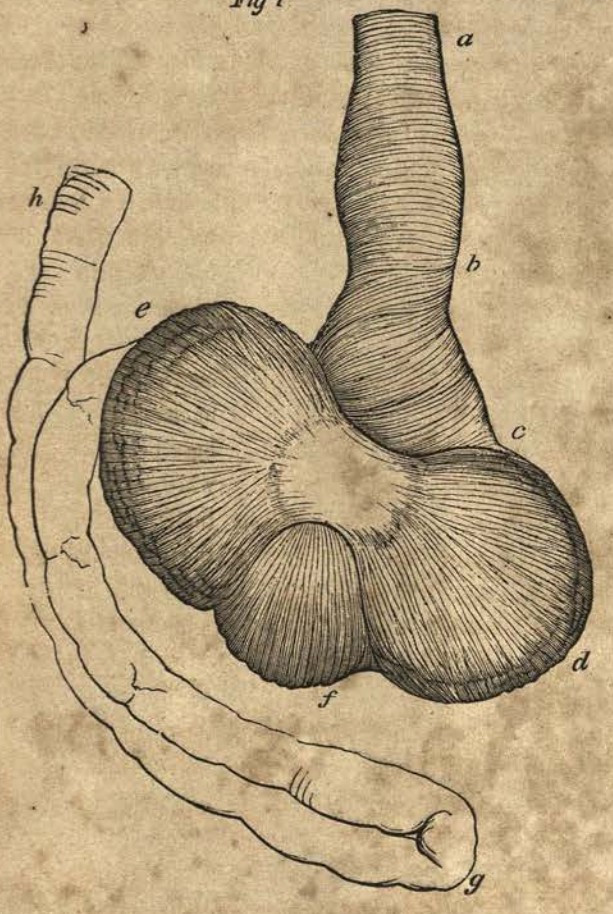
The female, which is somewhat smaller, is similar to the male.

Length to end of tail 23 inches, to end of wings 24, to end of claws 23¾; extent of wings 44½. Weight 2¼ lbs.

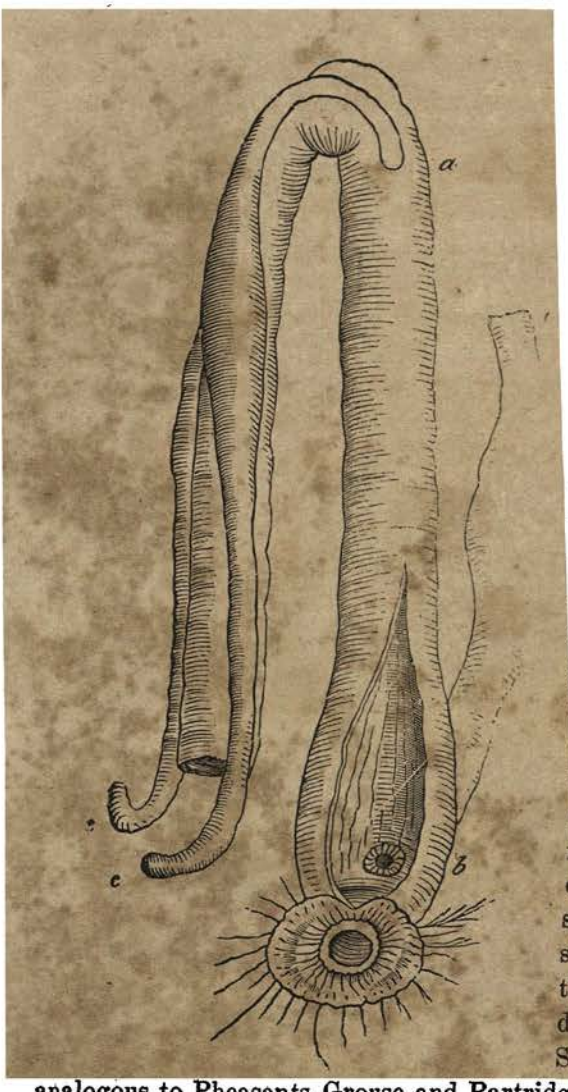
An adult female procured by Dr. Thomas M. Brewer, of Boston.

The roof of the mouth is concave, with a median row of short papillæ, two lateral series of flattened laminæ, and some irregularly scattered intermediate prominences, the lower mandible more concave. The tongue is fleshy, with the base papillate, the sides parallel and furnished with recurved papillæ, the tip rounded and thin, the entire length 1 inch 5 twelfths. The œsophagus, *a*, which is 13 inches long, is exceedingly slender, its diameter when contracted not being greater than that of the windpipe, or about 4 twelfths, but it is capable of being dilated to 6 twelfths; its inner coat thrown into prominent longitudinal rugæ. The proventriculus, *a b*, is enlarged to the breadth of 11 twelfths, its glandules simple, cylindrical

Fig 1

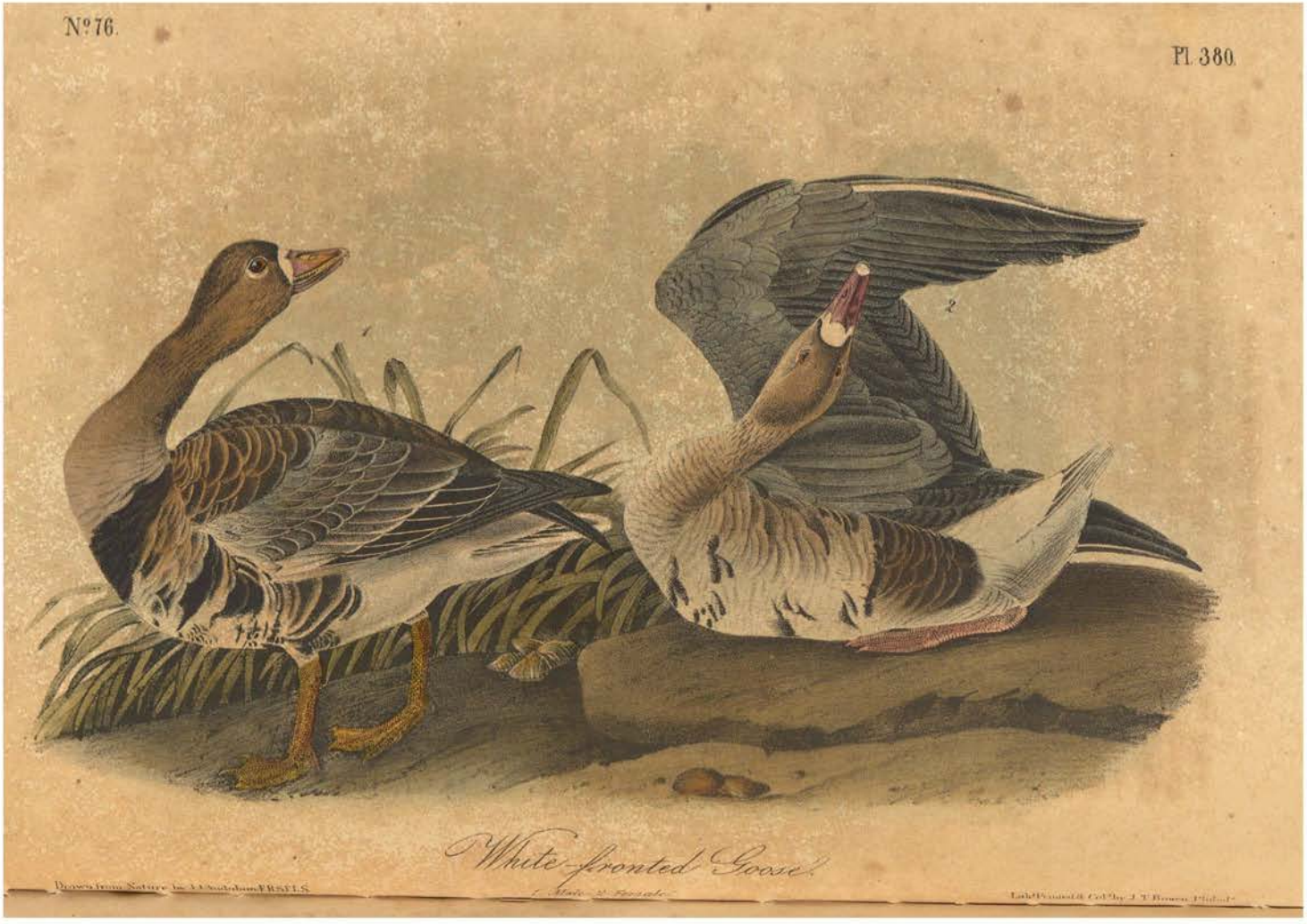


2 twelfths long. The stomach, *c d e f*, is a very highly developed muscular gizzard, placed obliquely, and of an elliptical form, its length being 1 inch 9 twelfths, its breadth 2 inches 11 twelfths. This great breadth is caused, as in other birds of this family, by the vast size of the lateral muscles, of which the left, *d*, has a thickness at the middle of 1 inch 4½ twelfths, the right, *e*, of 1 inch 3 twelfths, thus leaving but a very small space between the two grinding surfaces, which are placed obliquely. The lower muscle, *f*, is narrow and of moderate thickness. The epithelium is soft, unless on the two grinding plates, which are of an elliptical form, a little concave, smooth in the middle, longitudinally grooved toward the margins. The proventricular belt of glandules is 1 inch 3 twelfths in breadth. The stomach contained a large quantity of pure quartz sand. The pylorus is destitute of valve. The



duodenum, *e g h*, has a diameter of 4½ twelfths, and curves at the distance of 5 inches; the intestine is disposed in longitudinal folds, there being 16 turns, and measures 5 feet 11 inches in length. It retains a pretty uniform breadth as far as the rectum, Fig. 2, *a b*, which enlarges to 7 twelfths. The cæca, *a c c*, which come off at the distance of 5 inches from the extremity, are 5¼ inches in length, very narrow, their diameter at the base being about 1 twelfth, towards the end 2 twelfths, and their greatest breadth toward the middle 3½ twelfths. In Fig. 2 is seen part of the oviduct, *d b*, which opens at the distance of ½ inch from the anus, opposite *b*, and above or anterior to the ureters. In this bird there is no decided cloaca, which is equally the case with other species of this family, and with such birds generally as pass their fæces in a compact cylindrical form. In this respect, Swans, Geese, and Ducks are analogous to Pheasants, Grouse, and Partridges; they being in fact aquatic Gallinaceæ.

The trachea is 11 inches long, its diameter at the upper part 4½ twelfths. It is a little flattened above, less so in the middle, and somewhat compressed at the lower extremity, where its diameter is 3 twelfths. There are 150 free osseous rings, and 15 additional united rings at the lower part. The inferior larynx is destitute of muscles. The space between the last ring of the trachea and the first bronchial ring is large, being 4½ twelfths in length. The bronchi are very short, rather wide, with about ten incomplete rings, the extremities of which nearly meet. The lateral muscles are strong, and there is a pair of cleido-tracheal, and a pair of sterno-tracheal muscles, the former



White-fronted Goose.

1. Male. 2. Female.

Drawn from Nature by J. J. Audubon, F.R.S.L.S.

Lith. Printed & Col.d by J. T. Bowen, Philad.a

coming off at the distance of 2½ inches, the latter at that of 1 inch 2 twelfths, from the inferior larynx. The cleido-tracheal muscle is a direct continuation rf part of the contractor, but the sterno-tracheal is independent of them, and attached to two rings of the trachea. The contractor muscle terminates in the solid tube, at the distance of 9 twelfths from the inferior larynx.

THE WHITE-FRONTED GOOSE.

ANSER ALBIFRONS, *Bechst.*

PLATE CCCLXXX.—MALE AND FEMALE.

Neither WILSON nor NUTTALL seems to have been aware of the regularity with which this species migrate through the United States. When I shewed a drawing of it to the first of these authors, he pronounced it to be a young Snow Goose, although I described to him its peculiar notes. During the whole of my residence in Kentucky, a winter never passed without my seeing a good number of them; and at that season they are frequently offered for sale in the markets of New Orleans. An English gentleman, who was on his way to the settlement of Birkbeck in the prairies west of the Ohio, and who spent a few weeks with me at Henderson, was desirous of having a tasting of some of our game. His desire was fully gratified, and the first that was placed before him was a White-fronted Goose. I had killed seven of these birds the evening before, in a pond across the Ohio, which was regularly supplied with flocks from the beginning of October to the end of March. He pronounced it "delicious," and I have no reason to dissent from his opinion. From the numbers seen high on the Arkansas river, I presume that many winter beyond the southern limits of the United States. They are exceedingly rare, however, along our Atlantic coast. In Kentucky they generally arrive before the Canada Goose, betaking themselves to the grassy ponds; and of the different species which visit that country they are by far the least shy. The flocks seldom exceed from thirty to fifty individuals. Their general appearance is that exhibited in the plate, and which I consider as their winter plumage, feeling pretty confident that in summer the lower part of the body becomes pure black.

The flight of the White-fronted is very similar to that of the Canada Goose, being firm and well sustained. When travelling, these birds pass at a considerable height, arranged in the same angular order, and apparently guided by one of the older Ganders. They walk with ease, and can run with considerable speed when wounded. In feeding they immerse their necks like other species ; but during continued rains they visit the cornfields and large savannahs. While in Kentucky they feed on the beech nuts and acorns that drop along the margins of their favourite ponds. In the fields they pick up the grains of maize left by the squirrels and racoons, and nibble the young blades of grass. In their gizzards I have never found fishes nor water lizards, but often broken shells of different kinds of snails.

They leave us a fortnight sooner than the Canada Geese, and start along with the Snow Geese, but keep in separate flocks. In this order they have been observed travelling over the fur countries by Dr. RICHARDSON, who informs us that they breed in the woody districts skirting Mackenzie's river to the north of the sixty-seventh parallel, and also on the islands of the Arctic sea ; but that they are not common about Hudson's bay. The egg of this Goose measures two inches and three-quarters in length, by one and three-quarters in breadth. The shell is smooth, of a dull yellowish green, with indistinct patches of a darker tint of the same colour.

ANSER ALBIFRONS, Bonap. Syn., p. 376.
ANSER ALBIFRONS, *Laughing Goose*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 456
WHITE-FRONTED GOOSE, Nutt. Man., vol. ii. p. 346.
WHITE-FRONTED GOOSE, *Anser albifrons*, Aud. Orn. Biog., vol. iii. p. 568.

Male, 27¼, 60.

Through the interior of the Western and Southern States during winter, as well as along the coast, from Massachusetts to Texas. Columbia river. Breeds in the far north.

Adult Male.

Bill shorter than the head, much higher than broad at the base, somewhat conical, depressed towards the end, rounded at the tip. Upper mandible with the dorsal line sloping, the ridge broad and flattened, but slightly convex, the sides sloping, the edges with twenty-eight oblique lamellæ, the unguis circular, convex, obscurely denticulate along the edge. Nasal groove oblong, parallel to the ridge, filled by the soft membrane of the bill ; nostrils medial, lateral, longitudinal, narrow-elliptical, open, pervious. Lower mandible nearly straight, with the angle very long and rather narrow, the edges soft and obtuse, with about forty oblique, slightly recurved lamellæ.

Head of moderate size, oblong, compressed. Neck rather long and

slender. Body full, slightly depressed. Feet rather short, strong, placed rather behind the centre of the body; legs bare a little above the joint; tarsus rather short, a little compressed, covered all round with angular reticulated scales, which are smaller behind; hind toe very small, with a narrow membrane; third toe longest, fourth considerably shorter, but longer than second; all the toes reticulated above at the base, but with narrow transverse scutella towards the end; the three anterior connected by a reticulated membrane, the outer having a thick margin, the inner with the margin extended into a two-lobed web; claws small, arched, rather compressed, obtuse, that of the middle toe bent obliquely outwards and depressed, with a curved edge.

Plumage close, full, compact above, blended on the neck and lower part of the body, very short on the head. Feathers of the head and neck very narrow, on the latter part disposed in oblique series separated by grooves, of the back very broad and abrupt, of the breast and belly broadly rounded. Wings rather long, broad; primaries incurved, broad, towards the end tapering, the second longest, first and third about equal, first and second sinuate on the inner web, second and third on the outer; secondaries long, very broad, rounded. Tail very short, rounded, of sixteen broad rounded feathers.

Bill carmine-red, the unguis of both mandibles white. Edges of eyelids dull orange; iris hazel. Feet orange, webs lighter; claws white. Head and neck rich greyish-brown, the upper part of the former darker; a white band, margined behind with blackish-brown on the anterior part of the forehead along the bill. The general colour of the back is deep grey, the feathers of its fore part broadly tipped with greyish-brown, the rest with greyish-white; the hind part of the back pure deep grey. Wings greyish-brown, but towards the edge ash-grey, as are the primary coverts, and outer webs of the primaries; the rest of the primaries and the secondaries are greyish-black, the latter with a narrow edge of greyish-white, the former edged and tipped with white. Breast, abdomen, lower tail-coverts, sides of the rump and upper tail-coverts, white, but the breast and sides patched with brownish-black; on the latter intermixed with greyish-brown feathers.

Length to end of tail 27¼ inches, to end of wings 26, to end of claws 28¾; extent of wings 60; wing from flexure 14½; tail 4¾; bill along the back $1\frac{3}{12}$, along the edge of lower mandible $1\frac{7}{12}$; tarsus 2¼; middle toe $2\frac{4}{12}$, its claw $\frac{5}{12}$. Weight 5¼ lbs.

Adult Female.

The female, which is somewhat smaller, resembles the male; the white margins of the wing-feathers not so distinct. Weight 4 lbs. 4 oz.

The gizzard is very large, its muscular coat an inch and a half thick at the

lower extremity, the cuticular lining thick, very hard, and denticulate on one side. The intestine seven feet long, the cœca twelve inches, and placed at the distance of one foot from the anus.

SNOW GOOSE.

ANSER HYPERBOREUS, *Gmel.*

PLATE CCCLXXXI.—ADULT MALE AND YOUNG FEMALE.

The geographical range of the Snow Goose is very extensive. It has been observed in numerous flocks, travelling northward, by the members of the recent overland expeditions. On the other hand, I have found it in Texas, and it is very abundant on the Columbia river, together with Hutchins' Goose. In the latter part of autumn, and during winter, I have met with it in every part of the United States that I have visited.

While residing at Henderson on the Ohio, I never failed to watch the arrival of this and other species in the ponds of the neighbourhood, and generally found the young Snow Geese to make their appearance in the beginning of October, and the adult or white birds about a fortnight later. In like manner, when migrating northward, although the young and the adult birds set out at the same time, they travel in separate flocks, and, according to Captain Sir GEORGE BACK, continue to do so even when proceeding to the higher northern latitudes of our continent. It is not less curious that, during the whole of the winter, these Geese remain equally divided, even if found in the same localities; and although young and old are often seen to repose on the same sand-bar, the flocks keep at as great a distance as possible.

The Snow Goose in the grey state of its plumage is very abundant in winter, about the mouths of the Mississippi, as well as on all the muddy and grassy shores of the bays and inlets of the Gulf of Mexico, as far as Texas, and probably still farther to the south-west. During the rainy season, it betakes itself to the large prairies of Attacapas and Oppellousas, and there young and adult procure their food together, along with several species of Ducks, Herons, and Cranes, feeding, like the latter, on the roots of plants,

Snow Goose

Drawn from Nature by J.J.Audubon FRSFLS.

1.Adult male. 2.Young Female.

Lith.ª Printed & Col.ª by J. T. Bowen. Phila.ª

and nibbling the grasses sideways, in the manner of the Common Tame Goose. In Louisiana I have not unfrequently seen the adult birds feeding in wheat fields, when they pluck up the plants entire. When the young Snow Geese first arrive in Kentucky, about Henderson for instance, they are unsuspicious, and therefore easily procured. In a half-dry half-wet pond, running across a large tract of land, on the other side of the river, in the State of Indiana, and which was once my property, I was in the habit of shooting six or seven of a day. This, however, rendered the rest so wild, that the cunning of any "Red Skin" might have been exercised without success upon them; and I was sorry to find that they had the power of communicating their sense of danger to the other flocks which arrived. On varying my operations, however, and persevering for some time, I found that even the wildest of them now and then suffered; for having taken it into my head to catch them in large traps, I tried this method, and several were procured before the rest had learned to seize the tempting bait in a judicious manner.

The Snow Goose affords good eating when young and fat; but the old Ganders are tough and stringy. Those that are procured along the sea-shores, as they feed on shell-fish, fry, and marine plants, have a rank taste, which, however suited to the palate of the epicure, I never could relish.

The flight of this species is strong and steady, and its migrations over the United States are performed at a considerable elevation, by regular flappings of the wings, and a disposition into lines similar to that of other Geese. It walks well, and with rather elevated steps; but on land its appearance is not so graceful as that of our common Canada Goose. Whilst with us they are much more silent than any other of our species, rarely emitting any cries unless when pursued on being wounded. They swim buoyantly, and, when pressed, with speed. When attacked by the White-headed Eagle, or any other rapacious bird, they dive well for a short space. At the least appearance of danger, when they are on land, they at once come close together, shake their heads and necks, move off in a contrary direction, very soon take to wing, and fly to a considerable distance, but often return after a time.

I am unable to inform you at what age the Snow Goose attains its pure white plumage, as I have found that a judgment formed from individuals kept in confinement is not to be depended upon. In one instance at least, a friend of mine who had kept a bird of this species four years, wrote to me that he was despairing of ever seeing it become pure white. Two years after, he sent me much the same message; but, at the commencement of the next spring, the Goose was a Snow Goose, and the change had taken place in less than a month.

Dr. RICHARDSON informs us that this species "breeds in the barren grounds

of Arctic America, in great numbers. The eggs, of a yellowish-white colour, and regularly ovate form, are a little larger than those of the Eider Duck, their length being three inches, and their greatest breadth two. The young fly in August, and by the middle of September all have departed to the southward. The Snow Goose feeds on rushes, insects, and in autumn on berries, particularly those of the *Empetrum nigrum*. When well fed it is a very excellent bird, far superior to the Canada Goose in juiciness and flavour. It is said that the young do not attain the full plumage before their fourth year, and until that period they appear to keep in separate flocks. They are numerous at Albany Fort in the southern part of Hudson's Bay, where the old birds are rarely seen; and, on the other hand, the old birds in their migrations visit York Factory in great abundance, but are seldom accompanied by the young. The Snow Geese make their appearance in spring a few days later than the Canada Geese, and pass in large flocks both through the interior and on the coast."

The young birds of this species begin to acquire their whiteness about the head and neck after the first year, but the upper parts remain of a dark bluish colour until the bird suddenly becomes white all over; at least, this is the case with such as are kept in captivity. Although it is allied to the White-fronted or Laughing Goose, *Anser albifrons*, I was surprised to find that WILSON had confounded the two species together, and been of opinion that the Bean Goose also was the same bird in an imperfect state of plumage. That excellent ornithologist tells us that "this species, called on the sea-coast the Red Goose, arrives in the river Delaware, from the north, early in November, sometimes in considerable flocks, and is extremely noisy, their notes being shriller and more squeaking than those of the Canada, or common Wild Goose. On their first arrival, they make but a short stay, proceeding, as the depth of winter approaches, farther south; but from the middle of February, until the breaking up of the ice in March, they are frequently numerous along both shores of the Delaware, about and below Reedy Island, particularly near Old Duck Creek, in the State of Delaware. They feed on roots of the reeds there, which they tear up like hogs."

This species is rare both in Massachusetts and South Carolina, although it passes over both these States in considerable numbers, and in the latter some have been known to alight among the common domestic Geese, and to have remained several days with them. My friend Dr. BACHMAN, of Charleston, South Carolina, kept a male Snow Goose several years along with his tame Geese. He had received it from a friend while it was in its grey plumage, and the following spring it became white. It had been procured in the autumn, and proved to be a male. In a few days it became very gentle, and for several years it mated with a common Goose; but the eggs produced by

the latter never hatched. The Snow Goose was in the habit of daily frequenting a mill-pond in the vicinity, and returning regularly at night along with the rest; but in the beginning of each spring it occasioned much trouble. It then continually raised its head and wings, and attempted to fly off; but finding this impossible, it seemed anxious to perform its long journey on foot, and it was several times overtaken and brought back, after it had proceeded more than a mile, having crossed fences and plantations in a direct course northward. This propensity cost it its life: it had proceeded as far as the banks of the Cooper river, when it was shot by a person who supposed it to be a wild bird.

In the latter part of the autumn of 1832, whilst I was walking with my wife, in the neighbourhood of Boston in Massachusetts, I observed on the road a young Snow Goose in a beautiful state of plumage, and after making some inquiries, found its owner, who was a gardener. He would not part with it for any price offered. Some weeks after, a friend called one morning and told me this gardener had sent his Snow Goose to town, and that it would be sold by auction that day. I desired my friend to attend the sale, which he did; and before a few hours had elapsed, the bird was in my possession, having been obtained for seventy-five cents! We kept this Goose several months in a small yard at the house where we boarded, along with the young of the Sand-hill Crane, *Grus Americana*. It was fed on leaves and thin stalks of cabbage, bread, and other vegetable substances. When the spring approached, it exhibited great restlessness, seeming anxious to remove northward, as was the case with Dr. BACHMAN'S bird. Although the gardener had kept it four years, it was not white, but had the lower part of the neck and the greater portion of the back of a dark bluish tint, as represented in the plate. It died before we left Boston, to the great regret of my family, as I had anticipated the pleasure of presenting it alive to my honoured and noble friend the Earl of DERBY.

There can be little doubt that this species breeds in its grey plumage, when it is generally known by the name of Blue-winged Goose, as is the case with the young of *Grus Americana*, formerly considered as a distinct species, and named *Grus Canadensis*.

SNOW GOOSE, *Anas hyperborea*, Wils. Amer. Orn., vol. viii. p. 76.
ANSER HYPERBOREUS, Bonap. Syn., p. 376.
SNOW GOOSE, Nutt. Man., p. 344.
ANSER HYPERBOREUS, *Snow Goose*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 467.
SNOW GOOSE, *Anser hyperboreus*, Aud. Orn. Biog., vol. iv. p. 562.

Male, 31¼, 62. Female, 26, 55.

Western and Southern States, in autumn and winter. Breeds in the Arctic Regions. Abundant.

Adult Male.

Bill about the length of the head, much higher than broad at the base, somewhat conical, compressed, rounded at the tip. Upper mandible with the dorsal line sloping, the ridge broad and flattened at the base, narrowed towards the unguis, which is roundish and very convex, the edges beset with compressed, hard teeth-like lamellæ, their outline ascending and slightly arched; lower mandible ascending, nearly straight, the angle long and of moderate length, the dorsal line beyond it convex, the sides erect, and beset with lamellæ similar to those of the upper; but more numerous, the unguis obovate and very convex. Nasal groove oblong, parallel to the ridge, filled by the soft membrane of the bill; nostrils medial, lateral, longitudinal, narrow-elliptical, open, pervious.

Head of moderate size, oblong, compressed. Neck rather long and slender. Body full, slightly depressed. Feet rather short, strong, placed about the centre of the body; legs bare a little above the joint; tarsus rather short, strong, a little compressed, covered all round with hexagonal, reticulated scales, which are smaller behind; hind toe very small, with a narrow membrane; third toe longest, fourth considerably shorter, but longer than the second; all the toes reticulated above at the base, but with narrow transverse scutella towards the end; the three anterior connected by a reticulated membrane, the outer having a thick margin, the inner with the margin extended into a two-lobed web. Claws small, arched, rather compressed, obtuse, that of the middle toe bent obliquely outwards, and depressed, with a curved edge.

Plumage close, full, compact above, blended beneath, as well as on the head and neck, on the latter of which it is disposed in longitudinal bands, separated by narrow grooves; the feathers of the lateral parts small and narrow, of the back ovato-oblong, and abruptly rounded, of the lower parts curved and oblong. Wings rather long, broad; primaries strong, incurved, broad, towards the end tapering, the second longest, but only a quarter of an inch longer than the first, which scarcely exceeds the third; the first and second sinuate on the inner web, the second and third on the outer. Secondaries long, very broad, rounded, the inner curved outwards. Tail very short, rounded, of sixteen broad rounded feathers.

Bill carmine-red, the unguis of both mandibles white, their edges black. Iris light brown. Feet dull lake, claws brownish-black. The general colour of the plumage is pure white; the fore part of the head tinged with yellowish-red; the primaries brownish-grey, towards the end blackish-brown, their shafts white unless toward the end.

Length to end of tail 31$\frac{3}{4}$ inches, to end of claws 33$\frac{1}{2}$, to end of wings 31$\frac{3}{4}$, to carpus 14; extent of wings 62; wing from flexure 19$\frac{1}{2}$; tail 6$\frac{1}{4}$; bill along the ridge 2$\frac{3}{8}$, along the edge of lower mandible 3$\frac{1}{4}$; bare part of tibia $\frac{3}{4}$; tarsus 3$\frac{3}{8}$; hind toe $\frac{1}{2}$, its claw $\frac{1}{12}$; middle toe 3, its claw $\frac{4}{12}$. Weight 6$\frac{3}{4}$ lbs.

Young Female, in first winter.

The colours of the young bird, in its first plumage, are unknown; but in its second plumage, in autumn and winter, it presents the appearance exhibited in the plate. The bill is pale flesh-colour, its edges black, and the unguis bluish-white; the feet flesh-colour, the claws dusky. The head and upper part of the neck are white, tinged above with grey, the lower part of the neck all round, the fore part of the back, the scapulars, the fore part of the breast, and the sides, blackish-grey; paler beneath. The hind part of the back and the upper tail-coverts are ash-grey; as are the wing-coverts; but the secondary coverts are greyish-black in the middle; and all the quills are of that colour, the secondaries margined with greyish-white; the tail-feathers dusky-grey, broadly margined with greyish-white. The dark colour of the fore part of the breast gradually fades into greyish-white, which is the colour of the other inferior parts; excepting the axillar feathers, and some of the lower wing-coverts, which are white.

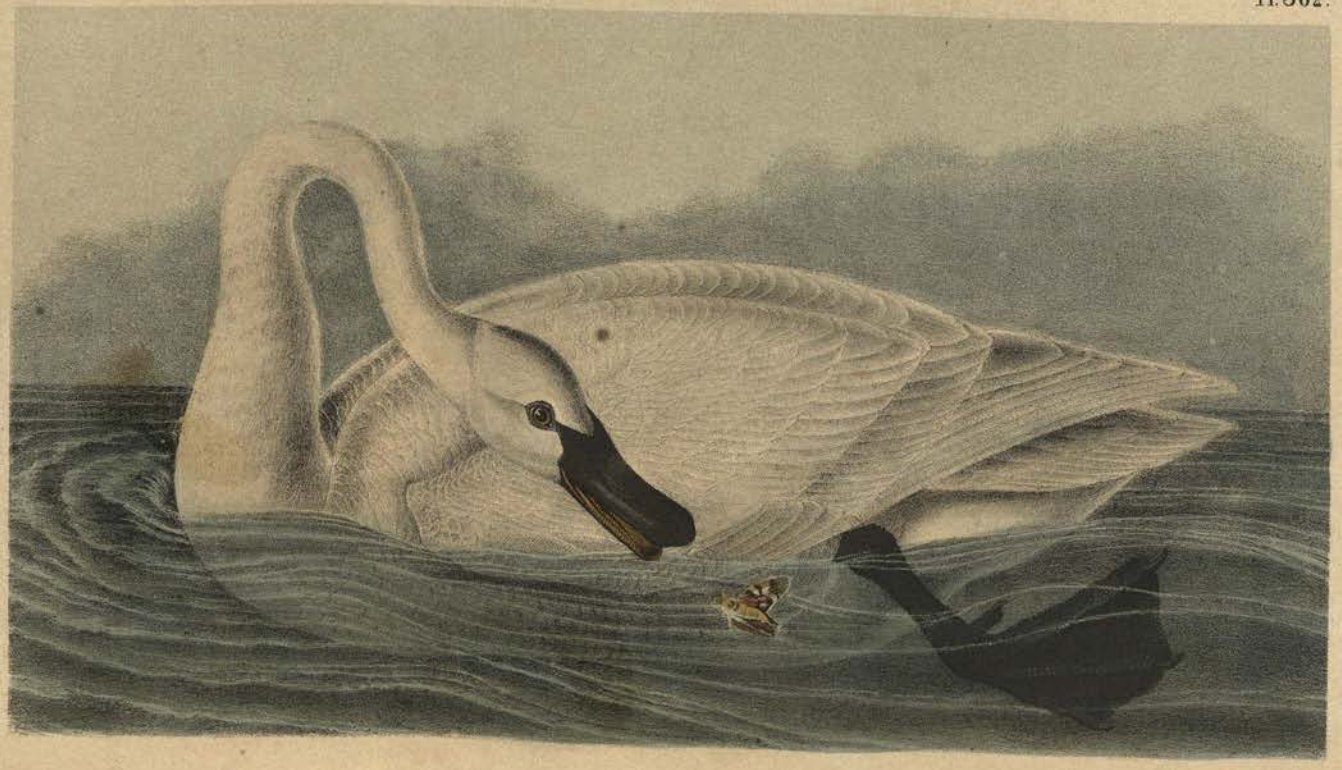
Length of an individual in this plumage, kept four years—to end of tail 26 inches, to end of claws 25; extent of wings 55; bill along the ridge 2$\frac{1}{4}$, from frontal angle 2$\frac{1}{2}$; tarsus 2$\frac{7}{12}$; hind toe $\frac{6}{12}$; its claw $\frac{4}{12}$; middle toe 2$\frac{1}{4}$, its claw $\frac{4}{12}$. Weight 2 lbs. 13 oz. The bird very poor.

In an adult male preserved in spirits, the roof of the mouth is moderately concave, with five series of strong conical papillæ directed backwards. The posterior aperture of the nares is linear, margined with two series of extremely slender papillæ. The marginal lamellæ of the upper mandible are 25, of the lower about 45. The tongue is 2 inches 5 twelfths long, nearly cylindrical, with strong pointed papillæ at the base, and on each side a series of flattened, sharp lamellæ, directed backwards, together with very numerous bristle-like filaments. It is fleshy, has a soft prominent pad at the base above, and towards the end has a median groove, the point rounded, thin, and horny. The œsophagus, which is 17 inches long, has a diameter of 9 twelfths at the upper part, and at the lower part of the neck is dilated to 1 inch. The proventricular glands are cylindrical, simple, and arranged in a belt nearly 1 inch in breadth. The other parts were removed.

The reddish tint on the head affords no indication of the age of the bird, some individuals of all ages having that part pure white, while others have it rusty. The same remark applies to our two Swans.

Genus III.—CYGNUS, *Meyer*. SWAN.

Bill longer than the head, higher than broad at the base, depressed, and a little widened toward the end, rounded; upper mandible with the dorsal line sloping, the ridge very broad at the base, with a large depression; narrowed between the nostrils, convex toward the end, the sides nearly erect at the base gradually becoming more horizontal and convex toward the end, the sides soft and thin, with numerous transverse little elevated internal lamellæ, the unguis obovate; nasal groove elliptical, sub-basal, covered by the soft membrane of the bill; lower mandible flattened, with the angle very long, and rather narrow, the sides convex, the edges with numerous transverse lamellæ. Nostrils submedial, longitudinal, placed near the ridge, elliptical. Head of moderate size, oblong, compressed; neck extremely long and slender; body very large, compact, depressed. Feet short, stout, placed a little behind the centre of the body; tibia bare for a very small space; tarsus short, a little compressed, covered all round with angular scales; hind toe extremely small, with a very narrow membrane; third longest, fourth very little shorter; anterior toes covered with angular scales for nearly half their length, then scutellate, and connected by broad reticulated entire membranes. Claws rather small, strong, arched, compressed, rather obtuse. Space between the bill and eye bare; plumage dense and soft. Wings long, broad; primaries curved, stiff, the second longest. Tail very short, graduated, of twenty or more feathers. Œsophagus very slender, at the lower part of the neck a little dilated; stomach transversely elliptical, with the lateral muscles extremely large, the epithelium dense, with two concave grinding surfaces; intestine long, and of moderate width; cœca rather large, narrow; cloaca globular. Trachea generally enters a cavity in the sternum, whence it is reflected, before it passes into the thorax; no inferior laryngeal muscles.



Trumpeter Swan

Adult.

Drawn from Nature by J.J Audubon, F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

Nº 77.
Pl. 383.
Trumpeter Swan.
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
Young
Lith. Printed & Col. by J. T. Bowen Philad.

TRUMPETER SWAN.

CYGNUS BUCCINATOR, *Richardson.*

PLATE CCCLXXXII.—ADULT. PLATE CCCLXXXIII.—YOUNG IN WINTER.

The history of the American Swans has been but very slightly traced. Few records of the habits of these majestic, elegant, and useful birds exist, on which much reliance can be placed; their geographical range still remains an unsolved problem; one species has been mistaken for another, and this by ornithologists who are said to be of the first order. The *Cygnus Bewickii* of Great Britain has been given as a North American Swan in place of *Cygnus Americanus* (well described by Dr. SHARPLESS of Philadelphia) in the Fauna Boreali-Americana; and the latter bird has been taken for the Whistling Swan, *C. musicus* of BECHSTEIN, by the Prince of MUSIGNANO, who says in his Synopsis, p. 379, No. 321, that it is "very numerous in winter in Chesapeake Bay." It is possible that we may have more than two species of Swan within the limits of North America, but I am at present acquainted with only that which forms the subject of this article, and the *Cygnus Americanus* of SHARPLESS.

In a note contained in the Journals of LEWIS and CLARK, written in the course of the expedition of these daring travellers across the Rocky Mountains, it is stated that "the Swans are of two kinds, the large and small. The large Swan is the same with the one common in the Atlantic States. The small differs from the large only in size and note; it is about one fourth less, and its note is entirely different. These birds were first found below the great narrows of the Columbia, near the Chilluckittequaw nation. They are very abundant in this neighbourhood, and remained with the party all winter, and in number they exceed those of the larger species in the proportion of five to one." These observations are partly correct and partly erroneous. In fact, the smaller species of the two, which is the *C. Americanus* of SHARPLESS, is the only one abundant in the middle districts of our Atlantic coast, while the larger Swan, the subject of this article, is rarely if ever seen to the eastward of the mouths of the Mississippi. A perfect specimen of the small Swan mentioned by LEWIS and CLARK has been transmitted to me from the Columbia river by Mr. TOWNSEND, and I find it to correspond in every respect with the *C. Americanus* of SHARPLESS. Mr.

TOWNSEND corroborates the observations of the two eminent travellers by stating, that the latter species is much more numerous than the large *C. Buccinator*.

The Trumpeter Swans make their appearance on the lower portions of the waters of the Ohio about the end of October. They throw themselves at once into the larger ponds or lakes at no great distance from the river, giving a marked preference to those which are closely surrounded by dense and tall cane-brakes, and there remain until the water is closed by ice, when they are forced to proceed southward. During mild winters I have seen Swans of this species in the ponds about Henderson until the beginning of March, but only a few individuals, which may have staid there to recover from their wounds. When the cold became intense, most of those which visited the Ohio would remove to the Mississippi, and proceed down that stream as the severity of the weather increased, or return if it diminished; for it has appeared to me, that neither very intense cold nor great heat suit them so well as a medium temperature. I have traced the winter migrations of this species as far southward as Texas, where it is abundant at times, and where I saw a pair of young ones in captivity, and quite domesticated, that had been procured in the winter of 1836. They were about two years old, and pure white, although of much smaller size than even the younger one represented in the plate before you, having perhaps been stinted in food, or having suffered from their wounds, as both had been shot. The sound of their well-known notes reminded me of the days of my youth, when I was half-yearly in the company of birds of this species.

At New Orleans, where I made the drawing of the young bird here given, the Trumpeters are frequently exposed for sale in the markets, being procured on the ponds of the interior, and on the great lakes leading to the waters of the Gulf of Mexico. This species is unknown to my friend, the Rev. JOHN BACHMAN, who, during a residence of twenty years in South Carolina, never saw or heard of one there; whereas in hard winters the *Cygnus Americanus* is not uncommon, although it does not often proceed farther southward than that State. The waters of the Arkansas and its tributaries are annually supplied with Trumpeter Swans, and the largest individual which I have examined was shot on a lake near the junction of that river with the Mississippi. It measured nearly ten feet in alar extent, and weighed above thirty-eight pounds. The quills, which I used in drawing the feet and claws of many small birds, were so hard, and yet so elastic, that the best steel-pen of the present day might have blushed, if it could, to be compared with them.

Whilst encamped in the Tawapatee Bottom, when on a fur-trading voyage, our keel-boat was hauled close under the eastern shore of the Mississippi,

and our valuables, for I then had a partner in trade, were all disembarked. The party consisted of twelve or fourteen French Canadians, all of whom were pretty good hunters; and as game was in those days extremely abundant, the supply of deer, bear, racoons, and opossums, far exceeded our demands. Wild Turkeys, Grouse, and Pigeons, might have been seen hanging all around; and the ice-bound lakes afforded an ample supply of excellent fish, which was procured by striking a strong blow with an axe on the ice immediately above the confined animal, and afterwards extricating it by cutting a hole with the same instrument. The great stream was itself so firmly frozen that we were daily in the habit of crossing it from shore to shore. No sooner did the gloom of night become discernible through the grey twilight, than the loud-sounding notes of hundreds of Trumpeters would burst on the ear; and as I gazed over the ice-bound river, flocks after flocks would be seen coming from afar and in various directions, and alighting about the middle of the stream opposite to our encampment. After pluming themselves awhile they would quietly drop their bodies on the ice, and through the dim light I yet could observe the graceful curve of their necks, as they gently turned them backwards, to allow their heads to repose upon the softest and warmest of pillows. Just a dot of black as it were could be observed on the snowy mass, and that dot was about half an inch of the base of the upper mandible, thus exposed, as I think, to enable the bird to breathe with ease. Not a single individual could I ever observe among them to act as a sentinel, and I have since doubted whether their acute sense of hearing was not sufficient to enable them to detect the approach of their enemies. The day quite closed by darkness, no more could be seen until the next dawn; but as often as the howlings of the numerous wolves that prowled through the surrounding woods were heard, the clanging cries of the Swans would fill the air. If the morning proved fair, the flocks would rise on their feet, trim their plumage, and as they started with wings extended, as if racing in rivalry, the pattering of their feet would come on the ear like the noise of great muffled drums, accompanied by the loud and clear sounds of their voice. On running fifty yards or so to windward, they would all be on wing. If the weather was thick, drizzly, and cold, or if there were indications of a fall of snow, they would remain on the ice, walking, standing, or lying down, until symptoms of better weather became apparent, when they would all start off. One morning of this latter kind, our men formed a plot against the Swans, and having separated into two parties, one above, the other below them on the ice, they walked slowly, on a signal being given from the camp, toward the unsuspecting birds. Until the boatmen had arrived within a hundred and fifty yards of them, the Swans remained as they were, having become, as it would appear, acquainted with us, in

consequence of our frequently crossing the ice ; but then they all rose on their feet, stretched their necks, shook their heads, and manifested strong symptoms of apprehension. The gunners meanwhile advanced, and one of the guns going off by accident, the Swans were thrown into confusion, and scampering off in various directions took to wing, some flying up, some down the stream, others making directly toward the shores. The muskets now blazed, and about a dozen were felled, some crippled, others quite dead. That evening they alighted about a mile above the camp, and we never went after them again. I have been at the killing of several of these Swans, and I can assure you that unless you have a good gun well loaded with large buck-shot, you may shoot at them without much effect, for they are strong and tough birds.

To form a perfect conception of the beauty and elegance of these Swans, you must observe them when they are not aware of your proximity, and as they glide over the waters of some secluded inland pond. On such occasions, the neck, which at other times is held stiffly upright, moves in graceful curves, now bent forward, now inclined backwards over the body. Now with an extended scooping movement the head becomes immersed for a moment, and with a sudden effort a flood of water is thrown over the back and wings, when it is seen rolling off in sparkling globules, like so many large pearls. The bird then shakes its wings, beats the water, and as if giddy with delight shoots away, gliding over and beneath the surface of the liquid element with surprising agility and grace. Imagine, reader, that a flock of fifty Swans are thus sporting before you, as they have more than once been in my sight, and you will feel, as I have felt, more happy and void of care than I can describe.

When swimming unmolested the Swan shews the body buoyed up ; but when apprehensive of danger, it sinks considerably lower. If resting and basking in the sunshine, it draws one foot expanded curiously towards the back, and in that posture remains often for half an hour at a time. When making off swiftly, the tarsal joint, or knee as it is called, is seen about an inch above the water, which now in wavelets passes over the lower part of the neck and along the sides of the body, as it undulates on the planks of a vessel gliding with a gentle breeze. Unless during the courting season, or while passing by its mate, I never saw a Swan with the wings raised and expanded, as it is alleged they do, to profit by the breeze that may blow to assist their progress; and yet I have pursued some in canoes to a considerable distance, and that without overtaking them, or even obliging them to take to wing. You, reader, as well as all the world, have seen Swans labouring away on foot, and therefore I will not trouble you with a description of their mode of walking, especially as it is not much to be admired.

The flight of the Trumpeter Swan is firm, at times greatly elevated and sustained. It passes through the air by regular beats, in the same manner as Geese, the neck stretched to its full length, as are the feet, which project beyond the tail. When passing low, I have frequently thought that I heard a rustling sound from the motion of the feathers of their wings. If bound to a distant place, they form themselves in angular lines, and probably the leader of the flock is one of the oldest of the males; but of this I am not at all sure, as I have seen at the head of a line a grey bird, which must have been a young one of that year.

This Swan feeds principally by partially immersing the body and extending the neck under water, in the manner of fresh-water Ducks and some species of Geese, when the feet are often seen working in the air, as if to aid in preserving the balance. Often however it resorts to the land, and then picks at the herbage, not sidewise, as Geese do, but more in the manner of Ducks and poultry. Its food consists of roots of different vegetables, leaves, seeds, various aquatic insects, land snails, small reptiles and quadrupeds. The flesh of a cygnet is pretty good eating, but that of an old bird is dry and tough.

I kept a male alive upwards of two years, while I was residing at Henderson in Kentucky. It had been slightly wounded in the tip of the wing, and was caught after a long pursuit in a pond from which it could not escape. Its size, weight, and strength rendered the task of carrying it nearly two miles by no means easy; but as I knew that it would please my wife and my then very young children, I persevered. Cutting off the tip of the wounded wing I turned it loose in the garden. Although at first extremely shy, it gradually became accustomed to the servants, who fed it abundantly, and at length proved so gentle as to come to my wife's call to receive bread from her hand. "Trumpeter," as we named our bird, in accordance with the general practice of those who were in the habit of shooting this species, now assumed a character which until then had been unexpected, and laying aside its timidity, became so bold at times as to give chase to my favourite Wild Turkey Cock, my dogs, children, and servants. Whenever the gates of our yard happened to be opened, he would at once make for the Ohio, and it was not without difficulty that he was driven home again. On one occasion he was absent a whole night, and I thought he had fairly left us; but imtimation came of his having travelled to a pond not far distant. Accompanied by my miller and six or seven of my servants, I betook myself to the pond, and there saw our Swan swimming buoyantly about as if in defiance to us all. It was not without a great deal of trouble that we at length succeeded in driving it ashore. Pet birds, good reader, no matter of what species they are, seldom pass their lives in accordance with the wishes

of their possessors; in the course of a dark and rainy night, one of the servants having left the gate open, Trumpeter made his escape, and was never again heard of.

With the manners of this species during the breeding season, its mode of constructing its nest, the number of its eggs, and the appearance of its young, I am utterly unacquainted. The young bird represented in the plate was shot near New Orleans on the 16th of December, 1822.

Dr. RICHARDSON informs us that it "is the most common Swan in the interior of the Fur Countries. It breeds as far south as lat. 61°, but principally within the arctic circle, and in its migrations generally precedes the Geese a few days."

CYGNUS BUCCINATOR, *Richardson's Trumpeter Swan*, F. Bor. Amer., vol. ii. p. 464.
TRUMPETER SWAN, *Cygnus Buccinator*, Nutt. Man., vol. ii. p. 370.
TRUMPETER SWAN, *Cygnus Buccinator*, Aud. Orn. Biog., vol. iv. p. 536; vol. v. p. 114.

Adult, 68; wing, 27. Young, 52½, 91.

Breeds from North California northward. Fur Countries. Abundant during winter on the Missouri, Mississippi, Ohio, and in Texas. Never seen eastward of South Carolina.

Adult Male.

Bill longer than the head, higher than broad at the base, depressed, and a little widened toward the end, rounded at the tip. Upper mandible with the dorsal line sloping, the ridge very broad at the base, with a large depression narrowed between the nostrils, convex toward the end, the sides nearly erect at the base, gradually becoming more horizontal and convex toward the end, the sides soft and thin, with forty-five transverse, little elevated lamellæ internally, the unguis obovate. Lower mandible narrow, flattened, with the angle very long, rather narrow, anteriorly rounded, the sides convex, the edges erect, inclinate, with about twenty-six external lamellæ, and about seventy above, the unguis obovate-triangular. Nasal groove elliptical, sub-basal, covered by the soft membrane of the bill; nostrils submedial, longitudinal, placed near the ridge, elliptical, pervious.

Head of moderate size, oblong, compressed; neck extremely long and slender; body very large, compact, depressed. Feet short, stout, placed a little behind the centre of the body; legs bare, an inch and a half above the joint, tarsus short, a little compressed, covered all round with angular scales, of which the posterior are extremely small. Hind toe extremely small, with a very narrow membrane; third toe longest, fourth very little shorter, second considerably shorter; anterior toes covered with angular scales for nearly half the length, scutellate in the rest of their extent, and connected by

broad reticulated entire membranes. Claws rather small, strong, arched, compressed, rather obtuse, that of the middle toe much larger, with a dilated thin edge.

A portion of the forehead about half an inch in length, and the space intervening between the bill and the eye, are bare. Plumage dense, soft, and elastic; on the head and neck the feathers oblong, acuminate; on the other parts in general broadly ovate and rounded, on the back short and compact. Wings long and broad, the anterior protuberance of the first phalangeal bone very prominent; primaries curved, stiff, tapering to an obtuse point; the second longest, exceeding the first by half an inch, and the third by a quarter of an inch; secondaries very broad and rounded, some of the inner rather pointed. Tail very short, graduated, of twenty-four stiffish, moderately broad, rather pointed feathers, of which the middle exceeds the lateral by two inches and a quarter.

Bill and feet black, the outer lamellate edges of the lower mandible, and the inside of the mouth, yellowish flesh-colour. The plumage is pure white, excepting the upper part of the head, which varies from brownish-red to white, apparently without reference to age or sex, as in *Cygnus Americanus* and *Anser hyperboreus*.

Length to end of tail 68 inches; bill along the ridge $4\frac{7}{12}$, from the eye to the tip 6, along the edge of lower mandible $4\frac{7}{12}$; breadth of upper mandible near the base $1\frac{5}{12}$, near the end $1\frac{6}{12}$; wing from flexure 27; tail $8\frac{1}{2}$; tarsus $4\frac{5}{12}$; first toe $\frac{10}{12}$, its claw $\frac{5}{12}$; second toe $4\frac{6}{12}$, its claw 1; third toe 6, its claw $1\frac{1}{12}$; fourth toe $5\frac{1}{12}$, its claw $\frac{10}{12}$.

Young after first moult.

In winter the young has the bill black, with the middle portion of the ridge, to the length of an inch and a half, light flesh colour, and a large elongated patch of light dull purple on each side; the edge of the lower mandible and the tongue dull yellowish flesh-colour. The eye is dark brown. The feet dull yellowish-brown, tinged with olive; the claws brownish-black; the webs blackish-brown. The upper part of the head and the cheeks are light reddish-brown, each feather having towards its extremity a small oblong whitish spot, narrowly margined with dusky; the throat nearly white, as well as the edge of the lower eyelid. The general colour of the other parts is greyish-white, slightly tinged with yellow; the upper part of the neck marked with spots similar to those on the head.

Length to end of tail $52\frac{1}{2}$ inches; extent of wings 91, wing from flexure $23\frac{1}{2}$; bill along the ridge $4\frac{1}{2}$, from the angle of the eye 6, along the edge of the lower mandible $4\frac{1}{2}$; tarsus $4\frac{1}{2}$; hind toe $1\frac{1}{4}$, its claw $\frac{3}{8}$; middle toe $6\frac{1}{4}$, its claw 1; inner toe $4\frac{1}{4}$, its claw $\frac{1}{2}$; outer toe $6\frac{1}{4}$, its claw $\frac{3}{4}$. Weight 19 lbs. 8 oz.; the bird very poor.

AMERICAN SWAN.

CYGNUS AMERICANUS, *Sharpless.*

PLATE CCCLXXXIV.—MALE.

I have never observed any Swans of this species along the Atlantic coast, or on the rivers that open upon it, beyond Cape Hatteras in North Carolina; and although they are very numerous on the waters of the Chesapeake Bay and the streams adjacent, as well as in other parts of the Middle Districts, I am yet of opinion that the great body of them spend the winter about the Columbia river, extending their autumnal migrations westward, along the shores of the Pacific Ocean, into California, and that the columns formed by these birds when about to leave their breeding grounds in high latitudes, divide into parties, of which the less numerous bands make their way from certain points as yet unknown, towards our Middle Districts, while the rest are perhaps following the valleys of the Rocky Mountains.

When travelling to a distance they proceed at a great height, with a steady and well-sustained flight, though by no means so rapid as that of the Trumpeter Swan, this difference probably arising from the greater weight and alar extent of the latter. They usually move in long lines forming the acute angle of a baseless triangle, the leader often changing his position and falling into the rear. On several occasions I have seen seven or eight leading the long single files behind them in a kind of disorderly crowded manner, which was continued until the birds were out of sight.

Not having had sufficient opportunities of studying the habits of these birds on the waters of the Chesapeake, where they are most numerous whilst in the Middle Districts, I here present you with an account of them kindly transmitted to me by Dr. SHARPLESS of Philadelphia:—

"About the first of September, the Swans leave the shores of the Polar Sea, according to FRANKLIN, and resort to the lakes and rivers in about the latitude of Hudson's Bay (60°), where they remain preparing for a departure for the winter until October, when they collect in flocks of twenty or thirty, and seizing favourable weather, with the wind not opposed to the direction of their flight, they mount high in the air, form a prolonged wedge, and with loud screams depart for more genial climes. When making either their semi-annual migration, or on shorter expeditions, an occasional scream

American Swan

Male

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

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equal to 'how do you all come on behind?' issues from the leader, which is almost immediately replied to by some posterior Swan with an 'all's well' vociferation. When the leader of the party becomes fatigued with his extra duty of cutting the air, he falls in the rear, and his neighbour takes his place. When mounted, as they sometimes are, several thousand feet above the earth, with their diminished and delicate outline hardly perceptible against the clear blue of heaven, this harsh sound, softened and modulated by distance, and issuing from the immense void above, assumes a supernatural character of tone and impression, that excites, the first time heard, a strangely peculiar feeling.

"In flying, these birds make a strange appearance; their long necks protrude and present, at a distance, mere lines with black points, and occupy more than one half their whole length, their heavy bodies and triangular wings seeming but mere appendages to the prolonged point in front.

"When thus in motion, their wings pass through so few degrees of the circle, that, unless seen horizontally, they appear almost quiescent, being widely different from the heavy semicircular sweep of the Goose. The Swan, when migrating, with a moderate wind in his favour, and mounted high in the air, certainly travels at the rate of one hundred miles or more an hour. I have often *timed* the flight of the Goose, and found one mile a minute a common rapidity, and when the two birds, in a change of feeding ground, have been flying near each other, which I have often seen, the Swan invariably passed with nearly double the velocity.

"The Swans in travelling from the northern parts of America to their winter residence, generally keep far inland, mounted above the highest peaks of the Alleghany, and rarely follow the water-courses like the Geese, which usually stop on the route, particularly if they have taken the sea-board. The Swans rarely pause on their migrating flight, unless overtaken by a storm, above the reach of which occurrence they generally soar. They have been seen following the coast in but a very few instances. They arrive at their winter homes in October and November, and immediately take possession of their regular feeding-grounds. They generally reach these places in the night, and the first signal of their arrival at their winter abode is a general burst of melody, making the shores ring for several hours with their vociferating congratulations, whilst making amends for a long fast, and pluming their deranged feathers. From these localities they rarely depart unless driven farther south by intensely cold weather, until their vernal excursion. When the spring arrives, a similar collection of forces as at the north takes place in March, and, after disturbing the tranquil bosom of the water for a night, by incessant washing and dressing, and alarming the quiet

neighbourhood by a constant clatter of consulting tongues, they depart for the north about daylight with a general *feu-de-joie* of unmusical screams.

"The Chesapeake Bay is a great resort for Swans during the winter, and whilst there they form collections of from one to five hundred on the flats, near the western shores, and extend from the outlet of the Susquehanna river almost to the Rip Raps. The connecting streams also present fine feeding grounds. They always select places where they can reach their food by the length of their necks, as they have never, so far as I can learn, been seen in this part of the world to dive under the water, either for food or safety. HEARNE says, that at Hudson's Bay, 'by diving and other manœuvres, it is impossible to take them by the hand while moulting.' I have often seated myself for hours, within a short distance of several hundred Swans, to watch their habits and manners, and never saw one pass entirely under the water, though they will keep the head beneath the surface for five minutes at a time.

"The food they are most partial to is the canvass-back grass (*Valisneria Americana*), worms, insects, and shell-fish; never, I believe, touching fish, however hardly pressed for support. The Geese and Swans frequently feed, but never fly, together.

"These birds are so exceedingly watchful, that if there are but three of them feeding together, one will generally be on guard, and when danger approaches there is some mute sign of alarm, for I have never heard a sound at such times.

"However much noise has been made before, the instant an alarm occurs, there is perfect silence, their heads are erected, a moment's examination determines the course, when if the case be not too urgent, they depend on swimming, if escape be necessary. They rarely fly even from the pursuit of a boat, unless very closely followed, and when they do arise from the water, either for escape or from choice, it is generally with a scream, and when alighting, particularly if among others, there is usually a 'how d'ye do' sort of expression on all sides. Even when wing-broken, these birds can swim with great rapidity, and if not otherwise hurt, a single oarsman in the best constructed boat can rarely overtake them. A gentleman who resides on the Chesapeake near Brush river, informed me, that a few years since, he had wounded a Swan, and afterwards cured and tamed it. To prevent it from flying away, he clipped its wing, but it occasionally escaped to the water, where he had often followed it for several miles, with two rowers, before he could catch it. The unwounded birds have frequently been seen to collect around a crippled companion, and urge it to escape, pushing it forward; and I have been informed by good authorities, that they have been observed to place themselves on each side of a disabled Swan, supporting a

broken wing, and almost lifting the object of their affectionate care out of the water.

"Whilst feeding and dressing, Swans make much noise, and through the night their vociferations can be heard for several miles. Their notes are extremely varied, some closely resembling the deepest base of the common tin-horn, whilst others run through every modulation of false note of the French-horn or clarionet. Whether this difference of note depends on age or sex I am not positively assured.

"The Swan requires five or six years to reach its perfect maturity of size and plumage, the yearling Cygnet being about one-third the magnitude of the adult, and having feathers of a deep leaden colour. The smallest Swan I have ever examined, and it was killed in my presence, weighed but eight pounds. Its plumage was very deeply tinted, and it had a bill of a very beautiful *flesh*-colour, and very soft. This Cygnet, I presume, was a yearling, for I killed one myself the same day, whose feathers were less dark, but whose bill was of a dirty white; and the bird weighed twelve pounds. This happened at a time when my attention was not turned scientifically to the subject, and I have forgotten other singularities of the specimens. By the third year the bill becomes black, and the colour of the plumage less intense, except on the top of the head and back of the neck, which are the last parts forsaken by the colour. Swans of the sixth year have assumed all the characters of the adult, and very old birds have a hard protuberance on the bend of the last joint of the wing. When less than six years of age, these birds are very tender and delicious eating, having the colour and flavour of the Goose; the latter quality, however, being more concentrated and luscious. HEARNE considers a Swan, 'when roasted, equal in flavour to young heifer beef, and the Cygnets are very delicate.' As these birds live to a great age, they grow more tough and dry as they advance, the *patriarchs* being as unmasticable and unsavoury as the Cygnets are tender and delightful.

"There are many modes practised in the United States of destroying these princely ornaments of the water. In shooting them whilst flying with the wind,' the writer just mentioned declares, 'they are the most difficult bird to kill I know, it being frequently necessary to take sight ten or twelve feet before the bill.' This I should consider an unnecessary allowance, unless driven by a hurricane, but, on ordinary occasions, the bill is aimed at, and if going with a breeze at a long shot, a foot before the bill would be quite sufficient. The covering is so extremely thick on old birds, that the largest *drop* shot will rarely kill unless the Swan is struck in the neck or under the wing, and I have often seen large masses of feathers torn from them, without for an instant impeding their progress.

"When wounded in the wing alone, a large Swan will readily beat off a dog, and is more than a match for a man in four feet water, a stroke of the wing having broken an arm, and the powerful feet almost obliterating the face of a good-sized duck-shooter. They are often killed by rifle-balls thrown from the shore into the feeding-column, and as a ball will *ricochet* on the water for several hundred yards, a wing may be disabled at the distance of half a mile.

"These birds are often brought within shooting range by sailing down upon them whilst feeding, and, as they arise against the wind, and cannot leave the water for fifteen or twenty yards, against which they strike their enormous feet and wings most furiously, great advantage is gained in distance. They must be allowed on *all* occasions to turn the side, for a breast-shot rarely succeeds in entering.

"When two feeding coves are separated by a single point, by disturbing the Swans in one or the other occasionally, they will pass and repass very closely to the projection of land, and usually taking, as they do, the straight line, each gunner, to prevent dispute, indicates the bird he will shoot at.

"In winter, boats covered by pieces of ice, the sportsman being dressed in white, are paddled or allowed to float during the night into the midst of a flock, and they have been oftentimes killed, by being knocked on the head and neck by a pole. There is, however, much danger in this mode, as others may be engaged in like manner, and shooting at a short distance, the persons might not be distinguished from the Swans. These birds seem well aware of the range of a gun, and I have followed them in a skiff for miles, driving a body of several hundreds before me, without the possibility of getting quite within shooting distance.

"The skins of Swans still covered by the down, which is very thick, are often used in our country for bonnets and tippets. The Indians also employ the skins for dresses for their women of rank, and the feathers for ornaments for the head.

"When more than one person is shooting, it is usual for each to select a particular Swan, and if there be not enough for all, two will take a particularly good bird, and, if it be killed, will decide its possession afterwards, by some *play* of chance. Few are willing to take the first bird, even though their position of *last* in the direction of flight would compel them, according to usage, to do so, not only from the difficulty and uselessness of killing the old ones, but because there is much less chance of a stray shot from a neighbour's gun assisting in the destruction.

"In the autumn of 1829, the writer, with another person, was on Abby Island, when seven Swans were approaching the point in one line, and three others a short distance behind them. The small group appeared

exceedingly anxious to pass the larger, and as they doubled the point at about sixty yards distance, the three formed with the second bird of the larger flock, a square of probably less than three feet. At this moment both guns were discharged, and three Swans were killed, and the fourth so much injured that he left the flock and reached the water a short distance in the bay; but it being nearly dark his direction was lost. These, with another that had been killed within an hour, and three which were subsequently obtained, were all of less than five years of age, and averaged a weight of eighteen pounds.

"The Swans never leave the open shores of the bay for the side streams, and the Geese rarely through the day, though they often retire to the little inlets to roost or feed at night. Few of these large game are found after their regular settlement, above Spesutie Island, but lay on the flats in mingled masses of from fifty to five hundred, down the western shores, even as far as the Potomac. During a still night, a few Swans may often be seen asleep in the middle of the bay, surrounded by a group of far more watchful Geese; and the writer has paddled at day-break one morning within ten feet of an enormous sleeping Swan, who had probably depended for alarm on the wary Geese, by which he had been surrounded, but which, as we approached, had swam away. By an unforeseen occurrence, when a few seconds would have enabled us to have stunned him by a blow, he became alarmed, and started in a direction that prevented a probable chance of killing, from our position, and the tottering nature of the skiff."

American Wild Swan, *Cygnus americanus*, Sharpless, Amer. Journ. of Sc. and Arts, vol. xxii.

American Swan, *Cygnus americanus*, Aud. Orn. Biog., vol. v. p. 133.

Male, 53, 84.

Common during winter in the Middle Atlantic Districts, especially on Chesapeake Bay. Not seen south of Carolina. Columbia river, breeds in the Fur Countries.

Adult Male.

Bill rather longer than the head, large, higher than broad at the base, gradually becoming more depressed. Upper mandible with the dorsal line concave at the commencement, then descending and very slightly convex to beyond the nostrils, at the end decurved; the ridge broad and flat at the base, gradually narrowed, convex toward the end; the sides nearly erect and somewhat concave at the base, gradually sloping, and towards the end convex, the margins nearly parallel until toward the end, when they widen a little; the tip rather abruptly rounded, the unguis truncato-obovate. Nostril

medial, elliptical, direct, near the ridge; nasal groove elliptical. Lower mandible flattened, slightly recurved; the angle long and rather narrow, the edges parallel, the tip truncate, the unguis somewhat triangular.

Head of moderate size, oblong, compressed. Neck very long and slender. Body very large. Feet short, stout, placed a little behind the centre of the body; tibia bare for an inch and a half, and reticulated; tarsus short, moderately compressed, reticulated all round with angular scales, of which the anterior are larger; hind toe very small, scutellate above, granulate beneath; anterior toes longer than the tarsus, the outer a little shorter than the third, all reticulate above as far as the second joint, scutellate in the rest of their extent, connected by webs of which the margin is entire, the outer with a thick margin, the inner with a broader two-lobed margin. Claws of moderate size, arched, strong, rather acute, that of the middle toe with the inner edge dilated.

Plumage full, compact above, blended beneath; feathers of the head and neck softer, small, ovate, rounded. Wings ample, convex; the first quill eight-twelfths of an inch shorter than the second, which is longest, but scarcely exceeds the third; the first, second, and third cut out on the inner web. Secondaries long, broad, and rounded. Tail very short, much rounded, of twenty broad rounded feathers, of which the lateral are an inch and nine-twelfths shorter than the middle. The bill and the bare space on the fore part of the head black, with an orange oblong patch from the anterior angle of the eye; sides of lower mandible and inside of mouth yellowish flesh-colour. Iris brown; feet and claws black. The plumage is entirely pure white.

Length to end of tail 53 inches, to end of wings 50½, to end of claws 58; extent of wings 84; bill along the ridge 4, from the tip to the eye $4\frac{8}{12}$; wing from flexure 22½; tail 7¼; tarsus $4\frac{9}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{8}{12}$; second toe $3\frac{8}{12}$, its claw $\frac{10}{12}$; third toe $\frac{9}{12}$, its claw $\frac{1}{12}$; fourth toe $4\frac{8}{12}$; its claw $\frac{7}{12}$. Weight 19¼ lbs. Another individual weighed only 14 lbs.

Individuals of both sexes have the upper part of the head and a portion of the neck tinged with brownish-red.

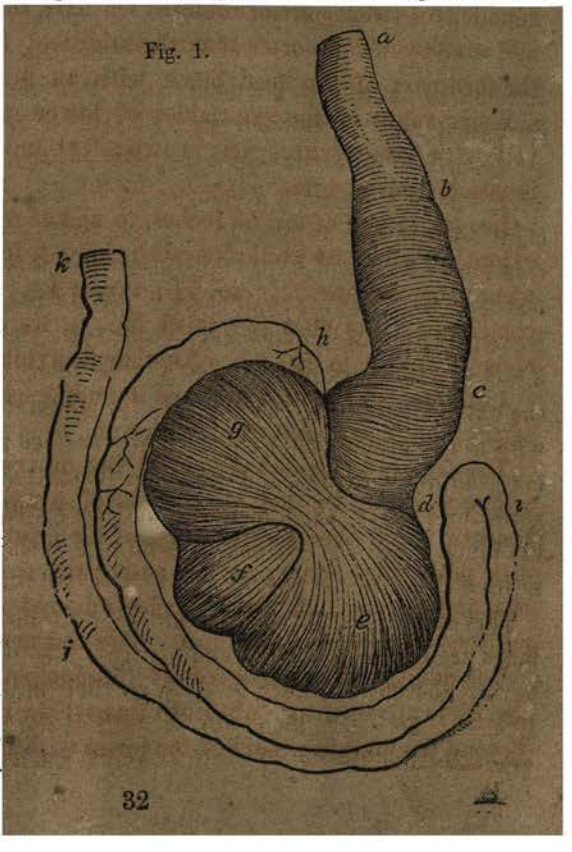
The female is somewhat smaller, but otherwise similar.

The young in its first plumage is of a uniform light bluish-grey, paler beneath, the fore and upper parts of the head tinged with red, the bill reddish flesh-colour, dusky at the point; the spaces between the eye and the bill, and between its basal angles, covered with minute feathers, which entirely disappear in the adult. The feet are dull yellowish flesh-colour.

An adult female, procured at Philadelphia. The edges of the upper mandible are soft, with about 40 transverse lamellæ, which do not project beyond the margin; those of the lower with about 60 marginal lamellæ, the

outer lamellæ only 22. Bill along the ridge $4\frac{1}{2}$ inches, from the angle of the eye to the tip $4\frac{11}{12}$; lower mandible along the edge $3\frac{1}{2}$; depth of bill at the angle of the mouth $1\frac{9}{12}$, its breadth at the nostrils $1\frac{4}{12}$, near the end $1\frac{5}{12}$. The roof of the mouth is deeply concave, with a medial prominent line, on which is a series of hard tubercles. The width of the mouth is 1 inch 5 twelfths. The eyes are very small, their diameter being 5 twelfths, the aperture of the ear 4 twelfths. The internal cells are of vast size; the right thoracic being 4 inches long, the right abdominal 6 inches, the right hepatic $5\frac{1}{2}$, the left hepatic 4, the left abdominal $3\frac{1}{2}$, the left thoracic 3. The heart is proportionally of large size, being 3 inches 2 twelfths in length, 2 inches 10 twelfths in breadth. The œsophagus, Fig. 1, *a b c*, is 2 feet 2 inches long, much narrower than the intestine, its average diameter being only 4 twelfths, but at the lower part of the neck it dilates to 8 twelfths; on entering the thorax, it passes obliquely to the left side, and the proventriculus, *b c*, has a diameter of 1 inch 2 twelfths. The inner coat of the œsophagus is thrown into strong longitudinal rugæ, and the muscular coat consists of two layers, the outer composed of longitudinal, the inner of transverse fibres. The stomach, *d e f g*, is obliquely situated on the left side, and is an extremely developed muscular gizzard, of an elliptical form, its length being 2 inches 6 twelfths, its breadth 3 inches 10 twelfths. The right lateral muscle, *g*, is 1 inch 9 twelfths thick, the left, *e*, 1 inch 4 twelfths. In the stomach is a large mass of very fine quartz sand, and a great number of germinating seeds of an elliptical form, some about 5 twelfths long, and of a brownish-yellow colour, together with shoots of *Salicornia*. The proventriculus is turgid with the latter. Its glands are extremely numerous, of a cylindrical form, about 3 twelfths in length. The epithelium, or inner coat of the stomach, is thick and tough, the two

Fig. 1.



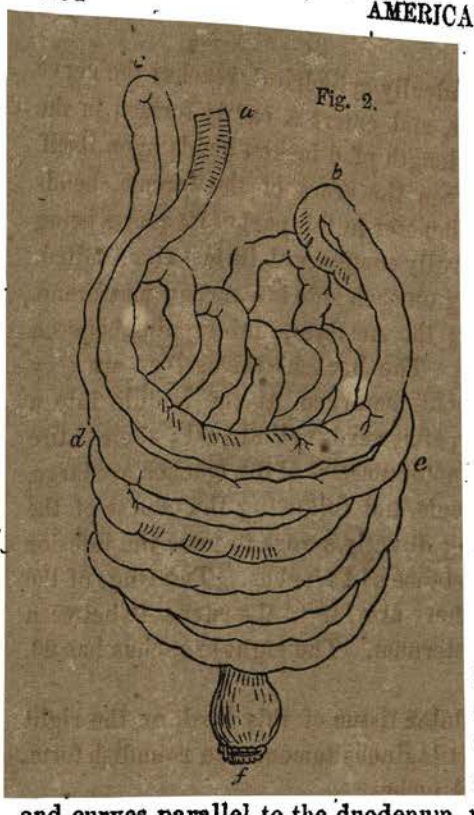


Fig. 2.

grinding surfaces considerably concave, smoothish, of a horny texture, 1 inch 8 twelfths long, 1 inch 5 twelfths broad. There is a large pyloric sac, from which the duodenum, *h i j k*, comes off. It curves round the edge of the stomach to the length of 8½ inches, as represented by Fig 2, *a b*, forming three-fourths of a circle, and reaching the sixth rib on the left side; it then curves back upon itself, *b c*, to above the stomach, where it receives the biliary ducts, passes upwards and backwards along the spine until it nearly reaches the anus, then returns forward as far as the upper edge of the stomach, then forms a small loop 3 inches long, comes forward again, passes backward, then forward, again backward and forward, now becomes anterior, and curves parallel to the duodenum, reaching the seventh rib, then passes backward, parallel to itself, as far as the liver, curves again in the same direction, and proceeds backward, then sweeps backward behind to near the anus, where it becomes accompanied by the cœca, comes forward on the right side to the anterior edge of the stomach, bends abruptly backwards, and terminates in the anus. It thus forms 16 curves or 8 folds. Its length is 11 feet 5 inches, its average diameter 7 twelfths. The rectum is 7 inches in length, 8 twelfths in diameter. The cœca 11 inches long, their diameter for 3 inches only 2 twelfths, in the rest of their extent from 3 to 4½ twelfths, the extremity obtuse. The cloaca is of moderate size and of a globular form, with longitudinal rugæ on its inner surface; that of the rectum is also longitudinally rugous, and covered with flattened papillæ. The transverse muscular fibres of the intestine are all very well marked in its whole extent; the inner surface is covered with minute prominences, arranged in regular series; the anterior portion beautifully villous.

This species has 11 ribs, the anterior rib not joining the sternum. The lungs are of large size, extending from the second to the ninth rib, and having, therefore, 7 deep grooves on their upper and inner surface. The trachea is 20 inches long; its breadth at the anterior part 9 twelfths. It gradually diminishes to 7 twelfths, and is much flattened until about 6 inches

from the furcula, when it becomes gradually cylindrical, reaches the curve of the furcula, bends a little upwards, and enters a cavity formed in the sternum, along which it passes to the length of 6 inches, bends upon itself horizontally, returns, passes up between the crura of the furcula, bends backwards, and enters the thorax, its diameter in this part of its course being 7 twelfths. The inferior larynx is laterally compressed, its last rings united. Appended to the last or semilunar ring on each side is a narrow membrane, terminated by a very slender half ring; the membrane intervening between it and the first bronchial ring is large. The bronchi themselves are very short, compressed at the commencement, enlarged at the middle into a roundish cavity 7½ twelfths in diameter, afterwards cylindrical; their entire length 1¾ inches. The lateral or contractor muscles of the trachea are large, and come off at the curve of the furcula, not following the course of the trachea within the sternum, but passing directly across to near the inferior larynx, where they terminate at the distance of 1¼ inches. The rings of the trachea are broad and well ossified; there are 148 to the curve, 40 between the lower larynx and its exit from the sternum. The right bronchus has 23, the left 21 rings.

In the external or subcutaneous cellular tissue of this bird, on the right side, over the thorax, was found a cartilaginous tumour of a roundish form, of which the greatest diameter was 1¼ inches.

Genus IV.—ANAS, *Linn.* DUCK.

Bill about the length of the head, somewhat higher than broad at the base, depressed and widened towards the end, rounded at the tip; upper mandible with the dorsal line sloping, and a little concave, the ridge at the base broad and flat, towards the end broadly convex, as are the sides, the edges soft and rather obtuse, the marginal lamellæ numerous, oblique; unguis decurved, obovate; nasal groove elliptical, sub-basal, filled by the soft membrane of the bill; lower mandible flattened, slightly recurvate, with the angle very long and narrow, the unguis roundish, the lamellæ numerous. Nostrils sub-basal, elliptical, near the ridge. Head of moderate size, oblong, compressed; neck

rather long and slender; body full, depressed. Feet short, stout, placed a little behind the centre of the body; tibia bare a little above the joint; tarsus short, somewhat compressed, anteriorly with small scutella, laterally and behind with angular scales; hind toe extremely small, with a very narrow membrane; third toe longest, fourth a little shorter, but longer than second; all covered with numerous oblique scutella; anterior connected by reticulated membranes. Claws small, arched, compressed, rather acute. Plumage dense, soft. Wings of moderate length, acute; second quill longest, first very little shorter; inner secondaries elongated and tapering; tail short, much rounded, of sixteen feathers. Œsophagus rather narrow, dilated on the lower part of the neck; stomach an extremely muscular, transversely elliptical gizzard; intestine long and rather wide; cœca long. Trachea of the males with a transverse bony unsymmetrical dilatation at the inferior larynx.

THE MALLARD.

ANAS BOSCHAS, *Linn.*

PLATE CCCLXXXV.—MALES AND FEMALES.

Although it is commonly believed that the Mallard is found abundantly everywhere in the United States, I have received sufficient proof to the contrary. If authors had acknowledged that they state so on report, or had said that in the tame state the bird is common, I should not have blamed them. According to my observation, and I may be allowed to say that I have had good opportunities, this valuable species is extremely rare in the wild state in the neighbourhood of Boston in Massachusetts; and in this assertion, I am supported by my talented and amiable friend Mr. NUTTALL, who resided there for many years. Farther eastward, this bird is so rare that it is scarcely known, and not one was seen by myself or my party beyond Portland in Maine. On the western coast of Labrador none of the inhabitants that we conversed with had ever seen the Mallard, and in Newfoundland the people were equally unacquainted with it, the species being in those countries replaced by the Black Duck, *Anas fusca*. From New York southward, the Mallards become more plentiful, and numbers of them

Mallard

1. 2. Males. 3. 4. Females.

Drawn from Nature by J.J. Audubon F.R.S. F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen. Philad.ª

are seen in the markets of Philadelphia, Baltimore, Richmond in Virginia, and other towns. Although they are very abundant in the Carolinas and Floridas, as well as in Lower Louisiana, they are much more so in the Western Country. The reason of this is merely that the Mallard, unlike the sea Ducks, is rarely seen on salt water, and that its course from the countries where it chiefly breeds is across the interior of the continent. From our great lakes, they spread along the streams, betake themselves to the ponds, wet meadows, submersed savannahs, and inland swamps, and are even found in the thick beech woods, in early autumn, and indeed long before the males have acquired the dark green colour of the head. Many of them proceed beyond the limits of the United States.

It would be curious to know when this species was first domesticated; but, reader, the solution of such a question is a task on which I shall not venture. In the domestic state every body knows the Mallard. When young it affords excellent food, and when old lays eggs. A bed made of its feathers is far preferable to the damp earth of the camp of an American woodsman, or the plank on which the trained soldier lays his wearied limbs at night. You may find many other particulars if you consult in chronological order all the compilers from ALDROVANDUS to the present day.

Be not startled, good reader, when I tell you that many of these Ducks are bred in the lakes near the Mississippi, nay even in some of the small ponds in the low lands or bottoms of the States of Kentucky, Indiana and Illinois; for in many parts of those districts I have surprised the females on their eggs, have caught the young when their mother was cautiously and with anxiety leading them for greater safety to some stream, and have shot many a fat one before the poor thing could fly, and when it was so plump, tender, and juicy, that I doubt much whether you, like myself, would not much prefer them to the famed Canvass-backed Duck.

Look at that Mallard as he floats on the lake; see his elevated head glittering with emerald-green, his amber eyes glancing in the light! Even at this distance, he has marked you, and suspects that you bear no good will towards him, for he sees that you have a gun, and he has many a time been frightened by its report, or that of some other. The wary bird draws his feet under his body, springs upon them, opens his wings, and with loud quacks bids you farewell.

Now another is before you, on the margin of that purling streamlet. How brisk are all his motions compared with those of his brethren that waddle across your poultry-yard! how much more graceful in form and neat in apparel! The Duck at home is the descendant of a race of slaves, and has lost his native spirit; his wings have been so little used that they can hardly

raise him from the ground. But the free-born, the untamed Duck of the swamps,—see how he springs on wing, and hies away over the woods.

The Mallards generally arrive in Kentucky and other parts of the Western Country, from the middle of September to the first of October, or as soon as the acorns and beech-nuts are fully ripe. In a few days they are to be found in all the ponds that are covered with seed-bearing grasses. Some flocks, which appear to be guided by an experienced leader, come directly down on the water with a rustling sound of their wings that can be compared only to the noise produced by an Eagle in the act of stooping upon its prey, while other flocks, as if they felt uneasy respecting the safety of the place, sweep around and above it several times in perfect silence, before they alight. In either case, the birds immediately bathe themselves, beat their bodies with their wings, dive by short plunges, and cut so many capers that you might imagine them to be stark mad. The fact, however, seems to be, that all this alacrity and gaiety only shews the necessity they feel of clearing themselves of the insects about their plumage, as well as the pleasure they experience on finding themselves in a milder climate, with abundance of food around them, after a hard journey of perhaps a day and a night. They wash themselves and arrange their dress, before commencing their meal; and in this other travellers would do well to imitate them.

Now, towards the grassy margins they advance in straggling parties. See how they leap from the water to bend the loaded tops of the tall reeds. Woe be to the slug or snail that comes in their way. Some are probing the mud beneath, and waging war against the leech, frog, or lizard that is within reach of their bills; while many of the older birds run into the woods, to fill their crops with beech-nuts and acorns, not disdaining to swallow also, should they come in their way, some of the wood-mice that, frightened by the approach of the foragers, hie towards their burrows. The cackling they keep up would almost deafen you, were you near them; but it is suddenly stopped by the approach of some unusual enemy, and at once all are silent. With heads erected on out-stretched necks, they anxiously look around. It is nothing, however, but a bear, who being, like themselves, fond of mast, is ploughing up the newly fallen leaves with his muzzle, or removing an old rotting log in search of worms. The Ducks resume their employment. But another sound is now heard, one more alarming. The bear raises himself on his hind legs, snuffs the air, and with a loud snort gallops off towards the depths of his cane-brake. The Ducks retreat to the water, betake themselves to the centre of the pool, and uttering half-stifled notes await the sight of the object they dread. There the enemy cunningly advances, first covered by one tree, then by another. He has lost his chance of the bear, but as he is pushed by hunger, a Mallard will do for the bullet of his rusty rifle. It is

an Indian, as you perceive by his red skin and flowing black hair, which, however, has been cut close from the sides of his head. In the centre of his dearly purchased blanket, a hole has been cut, through which he has thrust his bare head, and the ragged garment, like a horse's netting, is engaged as it were in flapping off the last hungry musquitoes of the season that are fast sucking the blood from his limbs. Watch him, Mallard. Nay, wait no longer, for I see him taking aim; better for you all to fly! No—well, one of you will certainly furnish him with a repast. Amid the dark wood rises the curling smoke, the report comes on my ear, the Ducks all rise save a pair, that, with back downwards and feet kicking against the air, have been hit by the prowler. The free son of the forest slowly approaches the pool, judges at a glance of the depth of the mire, and boldly advances, until with a cane he draws the game towards him. Returning to the wood, he now kindles a little fire, the feathers fill the air around; from each wing he takes a quill, to clean the touch-hole of his gun in damp weather; the entrails he saves to bait some trap. In a short time the Ducks are ready, and the hunter enjoys his meal, although brief time does he take in swallowing the savoury morsels. Soon the glimmering light of the moon will see him again on his feet, and lead him through the woods, as he goes in pursuit of other game.

The Mallards that remain with us during the whole year, and breed on the banks of the Mississippi or Lake Michigan, or in the beautiful meadows that here and there border the Schuylkill in Pennsylvania, begin to pair in the very heart of winter; and although Ducks are quite destitute of song, their courtships are not devoid of interest. The males, like other gay deceivers, offer their regards to the first fair one that attracts their notice, promise unremitting fidelity and affection, and repeat their offers to the next they meet. See that drake, how he proudly shows, first the beauty of his silky head, then the brilliancy of his wing-spots, and, with honeyed jabberings, discloses the warmth of his affection. He plays around this one, then around another, until the passion of jealousy is aroused in the breasts of the admired and flattered. Bickerings arise; the younger Duck disdains her elder sister, and a third, who conceives herself a coquette of the first order, interposes, as if to ensure the caresses of the feathered beau. Many tricks are played by Ducks, good reader, but ere long the females retire in search of a safe place in which they may deposit their eggs and rear their young. They draw a quantity of weeds around them, and form an ill-arranged sort of nest, in which from seven to ten eggs are laid. From their bodies they pluck the softest down, and placing it beneath the eggs, begin the long process of incubation, which they intermit only for short periods, when it becomes absolutely necessary to procure a little sustenance.

At length, in about three weeks, the young begin to cheep in the shell,

from which, after a violent struggle, they make their escape. What beautiful creatures! See how, with their little bills, they dry their downy apparel! Now, in a long line, one after another, they follow their glad mother to the water, on arriving at which they take to swimming and diving, as if elated with joy for having been introduced into existence. The male, wearied and emaciated, is far away on some other pond. The unnatural barbarian cares nothing about his progeny, nor has a thought arisen in his mind respecting the lonely condition of his mate, the greatness of her cares, or the sadness that she may experience under the idea that she has been utterly forsaken by him who once called her his only and truly beloved. No, reader, not a thought of this kind has he wasted on her whom he has left alone in charge of a set of eggs, and now of a whole flock of innocent ducklings, to secure which from danger, and see them all grow up apace, she manifests the greatest care and anxiety. She leads them along the shallow edges of grassy ponds, and teaches them to seize the small insects that abound there, the flies, the musquitoes, the giddy beetles that skim along the surface in circles and serpentine lines. At the sight of danger they run as it were on the water, make directly for the shore, or dive and disappear. In about six weeks, those that have escaped from the ravenous fishes and turtles have attained a goodly size; the quills appear on their wings; their bodies are encased with feathers; but as yet none are able to fly. They now procure their food by partial immersions of the head and neck in the manner of the old bird. At this period they are already fit for the table, and delicate as well as savoury food they afford. By the time that the leaves are changing their hues, the young Mallards take freely to their wings, and the old males join the congregated flocks.

The Squatters of the Mississippi raise a considerable number of Mallards, which they catch when quite young, and which, after the first year, are as tame as they can wish. These birds raise broods which are superior even to those of the wild ones, for a year or two, after which they become similar to the ordinary Ducks of the poultry-yard. The hybrids produced between the Mallard and the Muscovy Duck are of great size, and afford excellent eating. Some of these half-breeds now and then wander off, become quite wild, and have, by some persons, been considered as forming a distinct species. They also breed, when tame, with the Black Duck (*Anas fusca*) and the Gadwal, the latter connection giving rise to a very handsome hybrid, retaining the yellow feet and barred plumage of the one, and the green head of the other parent.

I have found the Mallard breeding on large prostrate and rotten logs, three feet above the ground, and in the centre of a cane-brake, nearly a mile distant from any water. Once I found a female leading her young through the

woods, and no doubt conducting them towards the Ohio. When I first saw her, she had already observed me, and had squatted flat among the grass, with her brood around her. As I moved onwards, she ruffled her feathers, and hissed at me in the manner of a Goose, while the little ones scampered off in all directions. I had an excellent dog, well instructed to catch young birds without injuring them, and I ordered him to seek for them. On this the mother took to wing, and flew through the woods as if about to fall down at every yard or so. She passed and repassed over the dog, as if watching the success of his search; and as one after another the ducklings were brought to me, and struggled in my bird-bag, the distressed parent came to the ground near me, rolled and tumbled about, and so affected me by her despair, that I ordered my dog to lie down, while, with a pleasure that can be felt only by those who are parents themselves, I restored to her the innocent brood, and walked off. As I turned round to observe her, I really thought I could perceive gratitude expressed in her eye; and a happier moment I never felt while rambling in search of knowledge through the woods.

In unfrequented parts, the Mallards feed both by day and by night; but in places where they are much disturbed by gunners, they feed mostly by night, or towards evening and about sunrise. In extremely cold weather, they betake themselves to the sources of streams, and even to small springs, where they may be found along with the American Snipe. At times, after heavy falls of rain, they are seen searching for ground-worms over the corn-fields, and during the latter part of autumn, the rice plantations of Georgia and the Carolinas afford them excellent pasture grounds. I have thought indeed that at this season these birds perform a second migration as it were, for they then pour into the rice-fields by thousands from the interior. In the Floridas, they are at times seen in such multitudes as to darken the air, and the noise they make in rising from off a large submersed savannah, is like the rumbling of thunder. So numerous were the Mallards while I was at General HERNANDEZ's in East Florida, that a single Negro whom that gentleman kept as a hunter, would shoot from fifty to a hundred and twenty in a day, thus supplying the plantation with excellent food.

The flight of the Mallard is swift, strong, and well sustained. It rises either from the ground or from the water at a single spring, and flies almost perpendicularly for ten or fifteen yards, or, if in a thick wood, until quite above the tops of the tallest trees, after which it moves horizontally. If alarmed, it never rises without uttering several *quacks*; but on other occasions it usually leaves its place in silence. While travelling to any distance, the whistling sound of their wings may be heard a great way off, more especially in the quiet of night. Their progress through the air I have thought might be estimated at a mile and a half in the minute; and I feel

very confident that when at full speed and on a long journey, they can fly at the rate of a hundred and twenty miles in the hour.

The Mallard is truly omnivorous, its food consisting of everything that can possibly satisfy the cravings of its extraordinary appetite. Nor is it at all cleanly in this respect, for it will swallow any kind of offals, and feed on all sorts of garbage, even putrid fish, as well as on snakes and small quadrupeds. Nuts and fruits of all kinds are dainties to it, and it soon fattens on rice, corn, or any other grain. My friend JOHN BACHMAN, who usually raises a great number of Mallards every year, has the young fed on chopped fish, on which they thrive uncommonly well. So very greedy are these birds, that I have often observed a couple of them tugging for a long time against each other for the skin of an eel, which was already half swallowed by the one, while the other was engaged at the opposite end. They are expert fly-catchers, and are in the habit of patting with their feet the damp earth, to force ground-worms out of their burrows.

Besides man, the enemies of the Mallard are the White-headed Eagle, the Snowy Owl, the Virginian Owl, the racoon, the lynx, and the snapping-turtle. Mallards are easily caught by snares, steel-traps baited with corn, and figure-of-four traps. As we have no decoys in the United States, I shall not trouble you with a new edition of the many accounts you will find in ornithological books of that destructive method of procuring Wild Ducks.

The eggs of this species measure two inches and a quarter in length, one inch and five-eighths in breadth. The shell is smooth, and of a plain light dingy green. They are smaller than those of the Tame Duck, and rarely so numerous. As soon as incubation commences, the males associate together in flocks, until the young are able to migrate. This species raises only one brood in the season, and I never found its nest with eggs in autumn. The female covers her eggs before she leaves them to go in search of food, and thus keeps them sufficiently warm until her return.

MALLARD, *Anas Boschas*, Wils. Amer. Orn., vol. viii. p. 112.
ANAS BOSCHAS, Bonap. Syn., p. 383.
ANAS (BOSCHAS) DOMESTICA, *Mallard*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 442.
MALLARD DUCK, *Anas domestica*, Nutt. Man., vol. ii. p. 378.
MALLARD, *Anas Boschas*, Aud. Orn. Biog., vol. iii. p. 164.

Male, 24, 36. Female, 22.

Breeds from Texas sparingly throughout the United States. Columbia river, and Fur Countries. Abundant during winter in all the Southern Districts. Not found in Maine, or farther eastward.

Adult Male.

Bill about the length of the head, higher than broad at the base, depressed

and widened towards the end, rounded at the tip. Upper mandible with the dorsal line sloping and a little concave, the ridge at the base broad and flat, towards the end broadly convex, as are the sides, the edges soft and rather obtuse, the marginal lamellæ transverse, fifty on each side; the unguis oval, curved, abrupt at the end. Nasal groove elliptical, sub-basal, filled by the soft membrane of the bill; nostrils sub-basal, placed near the ridge, longitudinal, elliptical, pervious. Lower mandible slightly curved upwards, with the angle very long, narrow, and rather pointed, the lamellæ about sixty.

Head of moderate size, oblong, compressed; neck rather long and slender; body full, depressed. Feet short, stout, placed a little behind the centre of the body; legs bare a little above the joint; tarsus short, a little compressed, anteriorly with small scutella, laterally and behind with reticulated angular scales. Hind toe extremely small, with a very narrow membrane; third toe longest, fourth a little shorter, but longer than second; all the toes covered above with numerous oblique scutella; the three anterior connected by reticulated membranes, the outer with a thick margin, the inner with the margin extended into a slightly lobed web. Claws small, arched, compressed, rather acute, that of the middle toe much larger, with a dilated thin inner edge.

Plumage dense, soft, and elastic; of the head and neck short, blended, and splendent; of the other parts in general broad and rounded. Wings of moderate length, acute; primaries narrow and tapering, the second longest, the first very little shorter; secondaries broad, curved inwards, the inner elongated and tapering. Tail short, much rounded, of sixteen acute feathers, of which the four central are recurved.

Bill greenish-yellow. Iris dark brown. Feet orange-red. Head and upper part of neck deep green, a ring of white about the middle of the neck; lower part of the neck anteriorly, and fore part of breast, dark brownish-chestnut; fore part of back light yellowish-brown, tinged with grey; the rest of the back brownish-black, the rump black, splendent with green and purplish-blue reflections, as are the recurved tail-feathers. Upper surface of wings greyish-brown, the scapulars lighter except their inner webs, and with the anterior dorsal feathers minutely undulated with brown. The speculum on about ten of the secondaries is of brilliant changing purple and green, edged with velvet-black and white, the anterior bands of black and white being on the secondary coverts. Breast, sides, and abdomen, very pale grey, minutely undulated with darker; lower tail-coverts black, with blue reflections.

Length to the end of the tail 24 inches, to the end of the claws 23, to the tips of the wings 22; extent of wings 36; wing from flexure $10\frac{1}{2}$; tail $4\frac{1}{4}$; bill $2\frac{2}{10}$; tarsus $1\frac{3}{4}$; middle toe $2\frac{2}{1\frac{2}{3}}$, its claw $\frac{5}{1\frac{2}{3}}$. Weight from $2\frac{1}{2}$ to 3 lbs.

Adult Male.

Bill black in the middle, dull orange at the extremities and along the edges. Iris as in the male, as are the feet. The general colour of the upper parts is pale yellowish-brown, streaked and spotted with dusky brown. The feathers of the head narrowly streaked, of the back with the margin and a central streak yellowish-brown, the rest dark, of the scapulars similar, but with the light streak on the outer web. The wings are nearly as in the male, the speculum similar, but with less green. The lower parts dull ochre, deeper on the lower neck, and spotted with brown.

Length 22 inches. Weight from 2 lbs. to 2½.

The Young acquire the full plumage in the course of the first winter.

DUSKY DUCK.

ANAS OBSCURA, *Gmel.*

PLATE CCCLXXXVI.—MALE AND FEMALE.

This species, which is known in all parts of the United States by the name of "Black Duck," extends its migrations from the Straits of Belle Isle, on the coast of Labrador, to Texas. Strange as the fact may appear, it breeds in both these countries, as well as in many of the intermediate districts. On the 10th of May, 1833, I found it breeding along the marshy edges of inland pools, near the Bay of Fundy, and, on Whitehead Island in the same bay, saw several young birds of the same species, which, although apparently not more than a week old, were extremely active both on land and in the water. On the 30th of April, 1837, my son discovered a nest on Galveston Island, in Texas. It was formed of grass and feathers, the eggs eight in number, lying on the former, surrounded with the down and some feathers of the bird, to the height of about three inches. The internal diameter of the nest was about six inches, and its walls were nearly three in thickness. The female was sitting, but flew off in silence as he approached. The situation selected was a clump of tall slender grass, on a rather sandy ridge, more than a hundred yards from the nearest water, but surrounded by partially dried salt-marshes. On the same island, in the course of several

Duskey Duck

1. Male. 2. Female.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen, Phulad.ª

successive days, we saw many of these Ducks, which, by their actions, shewed that they also had nests. I may here state my belief, that the Gadwall, Blue-winged Teal, Green-winged Teal, Mallard, American Widgeon, and Spoon-billed Duck, all breed in that country, as I observed them there late in May, when they were evidently paired. How far this fact may harmonize with the theories of writers respecting the migration of birds in general, is more than I can at present stop to consider. I have found the Black Duck breeding on lakes near the Mississippi, as far up as its confluence with the Ohio, as well as in Pennsylvania and New Jersey; and every one acquainted with its habits will tell you, that it rears its young in all the Eastern States intervening between that last mentioned and the St. Lawrence, and is of not less frequent occurrence along the margins of all our great lakes. It is even found on the Columbia river, and on the streams of the Rocky Mountains; but as Dr. RICHARDSON has not mentioned his having observed it in Hudson's Bay or farther north, we may suppose that it does not visit those countries.

On arriving in Labrador, on the 17th June, 1833, we found the Dusky Ducks in the act of incubation, but for nearly a month after, met with no young birds, which induced me to suppose that this species does not reach that country at so early a period as many others, but lingers behind so as to be nearly four weeks later than some of them. At the end of four weeks after our arrival, all the females we met with had young broods, which they led about the fresh-water ponds, and along their margins, either in search of food, or to secure them from danger. None of these broods exceeded seven or eight in number, and, at this early period of their life, we found them covered with long soft down of a deep brown colour. When alarmed they would dive with great celerity several times in succession, but soon became fatigued, made for the shore, ran a few feet from the water, and squatted among the grass, where they were easily caught either by some of our party, or by the Gulls, which are constantly on the look-out for such dainty food. At other times, as soon as the mother apprehends danger, she calls her young around her, when the little things form themselves into a line in her wake, and carefully follow her in all her movements. If a Hawk or a Gull make a plunge towards them, she utters a loud cry of alarm, and then runs as it were along the surface of the water, when the young dive as quick as lightning, and do not rise again until they find themselves among the weeds or the rocks along the shores. When they thus dive, they separate and pursue different directions, and on reaching the land lie close among the herbage until assured, by the well-known voice of their parent, that the danger is over. If they have often been disturbed in one pond, their anxious mother leads them overland to another; but she never, I believe, conducts

them to the open sea until they are able to fly. The young grow with remarkable rapidity, for, by the middle of August, they almost equal their parents in size; and their apprehension of danger keeps pace with their growth, for at the period of their southward migration, which takes place in the beginning of September, they are as wild and as cunning as the oldest and most experienced of their species. Each brood migrates separately; and the old males, which abandoned the females when incubation commenced, set out in groups of eight or ten. Indeed, it is not common to see birds of this species assemble in such flocks as their relatives the Mallards, although they at times associate with almost all the fresh-water Ducks.

The males, on leaving the females, join together in small bands, and retire into the interior of the marshes, where they remain until their moult is completed. My young friend COOLEDGE brought me a pair shot on the 4th of July, in Labrador, in so ragged a state that very few feathers remained even on the wings. On his approaching them, they skimmed over the surface of the water with such rapidity, that when shot at they seemed as if flying away. On examining these individuals I found them to be sterile, and I am of opinion that those which are prolific moult at a later period, nature thus giving more protracted vigour to those which have charge of a young brood. I think, reader, you will be of the same opinion, when I have told you, that on the 5th of July I found some which had young, and which were still in full plumage, and others, that were broodless, almost destitute of feathers.

As many of the nests found in Labrador differed from the one mentioned above, I will give you an account of them. In several instances, we found them imbedded in the deep moss, at the distance of a few feet or yards from the water. They were composed of a great quantity of dry grass and other vegetable substances; and the eggs were always placed directly on this bed without the intervention of the down and feathers, which, however, surrounded them, and which, as I observed, the bird always uses to cover them when she is about to leave the nest for a time. Should she be deprived of her eggs, she goes in search of a male, and lays another set; but unless a robbery of this kind happens, she raises only a single brood in the season. But although this is the case in Labrador, I was assured that this species rears two broods yearly in Texas, although, having been but a short time in that country, I cannot vouch for the truth of this assertion. The eggs are two inches and a quarter in length, one inch and five eighths in breadth, shaped like those of the domestic fowl, with a smooth surface, and of a uniform yellowish-white colour, like that of ivory tarnished by long exposure. The young, like those of the Mallard, acquire the full beauty of their

spring plumage before the season of reproduction commences, but exhibit none of the curious changes which that species undergoes.

Although the Dusky Duck is often seen on salt water bays or inlets, it resembles the Mallard in its habits, being fond of swampy marshes, rice-fields, and the shady margins of our rivers, during the whole of its stay in such portions of the Southern States as it is known to breed in. They are equally voracious, and may sometimes be seen with their crops so protruded as to destroy the natural elegance of their form. They devour, with the greatest eagerness, water-lizards, young frogs and toads, tadpoles, all sorts of insects, acorns, beech-nuts, and every kind of grain that they can obtain. They also, at times, seize on small quadrupeds, gobble up earth-worms and leeches, and when in salt-water, feed on shell-fish. When on the water, they often procure their food by immersing their head and neck, and, like the Mallard, sift the produce of muddy pools. Like that species also, they will descend in a spiral manner from on high, to alight under an oak or a beech, when they have discovered the mast to be abundant.

Shy and vigilant, they are with difficulty approached by the gunner, unless under cover or on horseback, or in what sportsmen call floats, or shallow boats made for the purpose of procuring water-fowl. They are, however, easily caught in traps set on the margins of the waters to which they resort, and baited with Indian corn, rice, or other grain. They may also be enticed to wheel round, and even alight, by imitating their notes, which, in both sexes, seem to me almost precisely to resemble those of the Mallard. From that species, indeed, they scarcely differ in external form, excepting in wanting the curiously recurved feathers of the tail, which Nature, as if clearly to distinguish the two species, had purposely omitted in them.

The flight of this Duck, which, in as far as I know, is peculiar to America, is powerful, rapid, and as sustained as that of the Mallard. While travelling by day they may be distinguished from that species by the whiteness of their lower wing-coverts, which form a strong contrast to the deep tints of the rest of their plumage, and which I have attempted to represent in the figure of the female bird in my plate. Their progress through the air, when at full speed, must, I think, be at the rate of more than a mile in a minute, or about seventy miles in an hour. When about to alight, they descend with double rapidity, causing a strong rustling sound by the weight of their compact body and the rapid movements of their pointed wings. When alarmed by a shot or otherwise, they rise off their feet by a single powerful spring, fly directly upwards for eight or ten yards, and then proceed in a straight line. Now, if you are an expert hand, is the moment to touch your trigger, and if you delay, be sure your shot will fall short.

As it is attached to particular feeding grounds, and returns to them until greatly molested, you may, by secreting yourself within shooting distance, anticipate a good result; for even although shot at, it will reappear several times in succession in the course of a few hours, unless it has been wounded. The gunners in the vicinity of Boston, in Massachusetts, who kill great numbers of these birds, on account of the high price obtained for them in the fine market of that beautiful and hospitable city, procure them in the following manner;—They keep live decoy Ducks of the Mallard kind, which they take with them in their floats or boats. On arriving at a place which they know to be suitable, they push or haul their boat into some small nook, and conceal it among the grass or rushes. Then they place their decoys, one in front of their ambush, the rest on either side, each having a line attached to one of its feet, with a stone at the other end, by which it is kept as if riding at anchor. One of the birds is retained in the boat, where the gunner lies concealed, and in cold weather amply covered with thick and heavy clothing. No sooner is all in order, than the decoy Ducks, should some wild birds appear, sound their loud call-notes, anxious as they feel to be delivered from their sad bondage. Should this fail to produce the desired effect of drawing the Wild Ducks near, the poor bird in the boat is pinched on the rump, when it immediately calls aloud; those at anchor respond, and the joint clamour attracts the travellers, who now check their onward speed, wheel several times over the spot, and at last alight. The gunner seldom waits long for a shot, and often kills fifteen or twenty of the Black Ducks at a single discharge of his huge piece, which is not unfrequently charged with as much as a quarter of a pound of powder and three quarters of a pound of shot!

The Black Ducks generally appear in the sound of Long Island in September or October, but in very cold weather proceed southward; while those which breed in Texas, as I have been informed, remain there all the year. At their first arrival they betake themselves to the fresh-water ponds, and soon become fat, when they afford excellent eating; but when the ponds are covered with ice, and they are forced to betake themselves to estuaries or inlets of the sea, their flesh becomes less juicy and assumes a fishy flavour. During continued frost they collect into larger bodies than at any other time, a flock once alighted seeming to attract others, until at last hundreds of them meet, especially in the dawn and towards sunset. The larger the flock, however, the more difficult it is to approach it, for many sentinels are seen on the look-out, while the rest are asleep or feeding along the shores. Unlike the "Sea Ducks," this species does not ride at anchor, as it were, during its hours of repose.

My friend, the Reverend Dr. JOHN BACHMAN, assures me that this bird,

which some years ago was rather scarce in South Carolina, is now becoming quite abundant in that state, where, during autumn and winter, it resorts to the rice-fields. After feeding a few weeks on the seeds it becomes fat, juicy, and tender. He adds that the farther inland, the more plentifully does it occur, which may be owing to the many steamers that ply on the rivers along the sea coast, where very few are to be seen. They are, however, followed in their retreats, and shot in great numbers, so that the markets of Charleston are now amply supplied with them. He also informs me that he has known hybrid broods produced by a male of this species and the common domestic Duck; and that he had three of these hybrid females, the eggs of all of which were productive. The young birds were larger than either of their parents, but although they laid eggs in the course of the following spring, not one of these proved impregnated. He further states that he procured three nests of the Dusky Duck in the State of New York.

The young of this species, in the early part of autumn, afford delicious eating, and, in my estimation, are much superior in this respect to the more celebrated Canvass-back Duck. That the species should not before now have been brought into a state of perfect domestication, only indicates our reluctance unnecessarily to augment the comforts which have been so bountifully accorded by Nature to the inhabitants of our happy country. In our eastern markets the price of these birds is from a dollar to a dollar and fifty cents the pair. They are dearer at New Orleans, but much cheaper in the States of Ohio and Kentucky, where they are still more abundant. Their feathers are elastic, and as valuable as those of any other species.

I have represented a pair of these birds procured in the full perfection of their plumage.

Dusky Duck, *Anas obscura*, Wils. Amer. Orn., vol. viii. p. 141.
Anas obscura, Bonap. Syn., p. 384.
Dusky Duck, *Anas obscura*, Nutt. Man., vol. ii. p. 392.
Dusky Duck, *Anas obscura*, Aud. Orn. Biog., vol. iv. p. 15.

Male, 24½, 38½. Female, 22, 34¼.

Breeds in Texas, westward, and throughout the United States, British Provinces, and Labrador. Columbia river. Common in autumn and spring along the Middle Atlantic Districts. Abundant in the Southern and Western States in winter.

Adult Male.

Bill about the length of the head, higher than broad at the base, depressed and widened towards the end, rounded at the tip. Upper mandible with the dorsal line sloping and a little concave, the ridge at the base broad and flat, towards the end broadly convex, as are the sides, the edges soft and thin, the

marginal lamellæ about forty on each side; the unguis obovate, curved, abrupt at the end. Nasal groove elliptical, sub-basal, filled by the soft membrane of the bill; nostrils sub-basal, placed near the ridge, longitudinal, elliptical, pervious. Lower mandible slightly curved upwards, flattened, with the angle very long, narrow, and rather pointed, the lamellæ about sixty.

Head of moderate size, oblong, compressed; neck rather long and slender; body full, depressed. Feet short, stout, placed a little behind the centre of the body; legs bare a little above the joint; tarsus short, a little compressed, anteriorly with small scutella, externally of which is a series continuous with those of the outer toe, laterally and behind with reticulated angular scales. Hind toe extremely small, with a very narrow membrane; third toe longest, fourth a little shorter, but longer than the second; the scutella of the second and third oblique, of the outer transverse; the three anterior toes connected by reticulated membranes, the outer with a thick margin, the inner with the margin extended into a slightly lobed web. Claws small, arched, compressed, rather obtuse, that of the middle toe much larger, with a dilated, thin edge.

Plumage dense, soft, and elastic; on the head and neck the feathers linear-oblong, on the other parts in general broad and rounded. Wings of moderate breadth and length, acute; primaries narrow and tapering, the second longest, the first very little shorter; secondaries broad, curved inwards, the inner elongated and tapering. Tail short, much rounded, of eighteen acute feathers, none of which are recurved.

Bill yellowish-green, the unguis dusky. Iris dark brown. Feet orange-red, the webs dusky. The upper part of the head is glossy brownish-black, the feathers margined with light brown; the sides of the head and a band over the eye are light greyish-brown, with longitudinal dusky streaks; the middle of the neck is similar, but more dusky. The general colour is blackish-brown, a little paler beneath, all the feathers margined with pale reddish-brown. The wing-coverts are greyish-dusky, with a faint tinge of green; the ends of the secondary coverts velvet-black. Primaries and their coverts blackish-brown, with the shafts brown; secondaries darker; the speculum is green, blue, violet, or amethyst purple, according to the light in which it is viewed, bounded by velvet black, the feathers also tipped with a narrow line of white. The whole under surface of the wing, and the axillaries, white.

Length to end of tail 24½ inches, to end of claws 26; extent of wings 38½; bill $2\frac{4}{12}$, along the back; wing from flexure 11½; tail $4\frac{4}{12}$; tarsus $1\frac{11}{12}$; middle toe $2\frac{3}{12}$, its claw $\frac{4}{12}$; first toe $\frac{5}{12}$, its claw $\frac{2}{12}$. Weight 3 lbs.

Adult Female.

The female, which is somewhat smaller, resembles the male in colour, but

is more brown, and has the speculum of the same tints, but without the white terminal line.

Length to end of tail 22 inches, to end of wings 21¼, to end of claws 22; wing from flexure 10½; extent of wings 34¼; tarsus 2, middle toe and claw 2½; hind toe and claw $\frac{5}{12}$.

In this species, the number of feathers in the tail is eighteen, although it has been represented as sixteen. In form and proportions the Dusky Duck is very closely allied to the Mallard. The following account of the digestive and respiratory organs is obtained from the examination of an adult male.

On the upper mandible are 43 lamellæ; on the lower, 85 in the upper, and 56 in the lower series. The tongue is $1\frac{1}{12}$ inches long, with the sides parallel and furnished with a double row of filaments, numerous small conical papillæ at the base, a median groove on the upper surface, and a thin rounded appendage, a twelfth and a half in length, at the tip. The aperture of the glottis is $7\frac{1}{12}$ long, with very numerous minute papillæ behind. The œsophagus 12 inches long, of a uniform diameter of $\frac{4}{12}$, until near the lower part of the neck, where it enlarges to $\frac{6}{12}$, again contracts as it enters the thorax, ending in the proventriculus, which is 1¼ long, with numerous oblong glandules, about a twelfth in length. Gizzard obliquely elliptical, 2¼ inches across, $1\frac{8}{12}$ in length, its lateral muscles extremely large, the left $\frac{9}{12}$ in thickness, the right $\frac{8}{12}$; their tendons large and strong; the lower muscle moderately thick; the cuticular lining firm and rugous, the grinding surfaces nearly smooth. The intestine, which is 5 feet 7¼ inches long, is slender and nearly uniform in diameter, measuring $\frac{4}{12}$ across in the duodenal portion, $\frac{3}{12}$ in the rest of its extent; the rectum 3¼ inches long, dilated into a globular cloaca 1 inch in length, and of nearly the same diameter. The cœca are 6¼ long, $\frac{1}{12}$ in diameter for 2 inches of their length, enlarged to $\frac{3}{12}$ in the rest of their extent, and terminating in an obtuse extremity.

The trachea, moderately extended, is 10 inches long. Its lateral or contractor muscles are strong, and it is furnished with a pair of cleido-tracheals, and a pair of sterno-tracheals. The number of rings is 136, besides 12 united rings forming a large inferior larynx, which has a transversely oblong bony expansion, forming on the left side a bulging and rounded sac. There are 28 bronchial half rings on the right side, 26 on the left.

BREWER'S DUCK.

ANAS BREWERI, *Aud.*

PLATE CCCLXXXVII.—MALE.

The beautiful Duck from which I made the drawing copied on the plate before you, was shot on Lake Barataria, in Louisiana, in February, 1822. It was in company with seven or eight Canvass-back Ducks. No other individuals of the species were in sight at the time, and all my efforts to procure another have been ineffectual.

The individual figured was a male; but I have some doubts whether it had acquired the full beauty of its matured plumage, and I considered it at the time as a bird of the preceding season.

In form and proportions this bird is very nearly allied to the Mallard, from which it differs in having the bill considerably narrower, in wanting the recurved feathers of the tail, in having the feet dull yellow in place of orange red, the speculum more green and duller, without the white bands of that bird, and in the large patch of light red on the side of the head. It may possibly be an accidental variety, or a hybrid between that bird and some other species, perhaps the Gadwall, to which also it bears a great resemblance.

Bill nearly as long as the head, higher than broad at the base, depressed and widened towards the end, rounded at the tip, the lamellæ short and numerous, the unguis obovate, curved, the nasal groove elliptical, the nostrils oblong.

Head of moderate size, oblong, compressed; neck rather long and slender, body full, depressed. Feet short, stout, placed behind the centre of the body; legs bare a little above the joint; tarsus short, a little compressed, anteriorly with small scutella, laterally and behind with reticulated angular scales. Hind toe very small, with a narrow free membrane; third toe longest, fourth a little shorter; claws small, arched, compressed, acute.

Plumage dense, soft, and elastic; of the hind neck and head short and blended; of the other parts in general broad and rounded. Wings of moderate length, acute; tail short, graduated.

Bill dull yellow, slightly tinged with green, dusky along the ridge. Iris brown. Feet dull yellow, claws dusky, webs dull grey. Head and upper

Brewers Duck

Male.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. Lith.d Printed & Col.d by J. T. Bowen Philad.a

part of the neck deep glossy green; but there is an elongated patch of pale reddish-yellow, extending from the base of the bill over the cheek to two inches and a quarter behind the eye, and meeting that of the other side on the chin; the space immediately over and behind the eye light dull purple. A narrow ring of pale yellowish-red on the middle of the neck; the lower part of the neck dull brownish-red, the feathers with a transverse band of dusky, and edged with paler. The upper parts are dull greyish-brown, transversely undulated with dusky; the smaller wing-coverts without undulations, but each feather with a dusky bar behind another of light dull yellow; first row of smaller covers tipped with black; primaries and their coverts, light brownish-grey; some of the outer secondaries similar, the next five or six duck-green, the next light grey, with a dusky patch toward the end. The rump and upper tail-coverts black, as are the parts under the tail, excepting two longitudinal white bands; tail-feathers light brownish grey, edged with whitish. All the rest of the lower parts are greyish-white, tinged with yellow, beautifully undulated with dusky lines, on the middle of the breast these lines less numerous, and each feather with a reddish-grey central streak.

Length to end of tail 23 inches, to end of claws 24; extent of wings 39; bill along the ridge 2½, along the edge of lower mandible 2⅝; tarsus 1⅛, middle toe 2, its claw $\frac{5}{12}$; hind toe $\frac{3}{8}$, its claw $\frac{1}{8}$. Weight 2 lbs. 9 oz.

I have named this Duck after my friend THOMAS M. BREWER of Boston, as a mark of the estimation in which I hold him as an accomplished ornithologist.

BREWER'S DUCK, *Anas Breweri*, Aud. Orn. Biog., vol. iv. p. 302.

Male, 23, 39.

One specimen procured in Louisiana.

GADWALL DUCK.

ANAS STREPERA, *Linn.*

PLATE CCCLXXXVIII.—MALE AND FEMALE.

I have met with this species along the whole of our Atlantic coast, from Eastport in Maine to Texas. It is, however, more abundant in the interior than in most of our maritime districts, and is particularly so on the tributaries of the Ohio, Missouri, and Mississippi. In the early part of autumn and late in spring many are found on the margins of our great lakes. Yet the Gadwall has been represented as not plentiful in the United States, probably on account of its being generally dispersed, and not congregated in particular districts.

The Creoles of Louisiana name it "Violon," on account of the whistling sound of its wings. It arrives in the neighbourhood of New Orleans and the mouths of the Mississippi along with the Widgeon, and is fond of the company of the Red-head, to which it is about equal as an article of food. The Gadwalls are usually seen in small flocks, and during winter resort to the larger lakes and the pools in the interior of the great marshes, adjoining the waters of the Gulf. In that part of the country they feed on small fish, insects, and aquatic grasses. Fewer of them are found in Massachusetts and the State of New York than elsewhere, and this probably on account of these districts being more elevated and less marshy than those farther south. My friend Dr. BACHMAN informs me that they are rather plentiful in South Carolina, where they are considered good eating, and where they arrive in the beginning of October, but are more frequently met with at that season, and in early spring, than during winter, when a single individual may sometimes be seen in a flock of other Ducks.

While we were in Texas, in the latter part of April and the beginning of May, we found the Gadwall quite abundant on all the inland ponds and streams, as well as on the brackish pools and inlets of the islands and shores of Galveston Bay. Many of them had paired and separated from the other ducks; and I was assured that this species breeds there, as does the Dusky Duck, the Mallard, the Blue-winged Teal, the Widgeon, and the Shoveller, the young of all these species being plentiful in the end of June and beginning of July. I was satisfied as to the truth of the repeated assurances I had

Gadwall Duck.

1. Male 2. Female.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen. Phila.a

received on this subject, by observing the manners of individuals of all these species before my departure from that country. After a continuance of rainy weather, Gadwalls are found in great numbers on the vast prairies of Oppelousas and Attacapas, where I have been told they continue until very late in spring, and some remain to breed.

This species dives well on occasion, especially on being wounded. At the appearance of danger, it rises on wing—whether from the ground or from the water—at a single spring, in the manner of the Mallard, and, like it also, ascends almost perpendicularly for several yards, after which it moves off in a direct course with great celerity. I have never seen it dive on seeing the flash of the gun; but when approached it always swims to the opposite part of the pond, and, when the danger increases, flies off. On being wounded, it sometimes by diving makes its escape among the grass, where it squats and remains concealed. It walks with ease, and prettily, often making incursions upon the land, when the ponds are not surrounded by trees, for the purpose of searching for food. It nibbles the tender shoots and blades of grasses with apparent pleasure, and will feed on beech-nuts, acorns, and seeds of all kinds of Gramineæ, as well as on tadpoles, small fishes, and leeches. After rain it alights in the corn-fields, like the Mallard, and picks up the scattered grains of maize. The common notes or cry of the female have a considerable resemblance to those of the female Mallard; but the cry of the male is weaker, as in that species.

It is by no means shy in the Western Country, where I have often found it associating with other species, which would leave the pond before it. Near the sea, however, it is much more wary, and this no doubt on account of the greater number of persons who there follow shooting as a regular and profitable employment. From the following note of my friend Dr. BACHMAN, you may judge how easily this fine species might be domesticated.

"In the year 1812, I saw in Dutchess county, in the State of New York, at the house of a miller, a fine flock of Ducks, to the number of at least thirty, which, from their peculiar appearance, struck me as differing from any I had before seen among the different varieties of the tame Duck. On inquiry, I was informed that three years before, a pair of these Ducks had been captured in the mill-pond, whether in a trap, or by being wounded, I cannot recollect. They were kept in the poultry-yard, and, it was said, were easily tamed. One joint of the wing was taken off, to prevent their flying away. In the following spring they were suffered to go into the pond, and they returned daily to the house to be fed. They built their nest on the edge of the pond, and reared a large brood. The young were perfectly reconciled to domestication, and made no attempts, even at the migratory season, to fly away, although their wings were perfect. In the following

season they produced large broods. The family of the miller used them occasionally as food, and considered them equal in flavour to the common Duck, and more easily raised. The old males were more beautiful than any that I have examined since; and as yet domestication had produced no variety in their plumage."

The migration of this species extends to the Fur Countries, where it is said to breed. The description of a male killed on the Saskatchewan river, on the 22nd of May, 1827, is given in the Fauna Boreali-Americana; and I have a fine male procured by Mr. TOWNSEND on the Columbia river.

GADWALL, *Anas strepera*, Wils. Amer. Orn., vol. viiii. p. 120.
ANAS STREPERA, Bonap. Syn., p. 383.
ANAS (CHAULIODUS) STREPERA, *Gadwall*, Swains. and Rich. F. Bor. Amer., vol. ii, p. 440.
GADWALL or GREY, Nutt. Man., vol. ii. p. 383.
GADWALL DUCK, *Anas strepera*, Aud. Orn. Biog., vol. iv. p. 353.

Male, 21½, 35. Female, 19¼, 31.

Breeds in Texas, and westward to the Columbia river, Fur Countries, and sometimes in the States of New York, Massachusetts, and Maine. Rather common in autumn and spring in the middle Atlantic districts; more so in the Southern and Western States.

Adult Male.

Bill nearly as long as the head, deeper than broad at the base, depressed towards the end, the sides parallel, the tip rounded. Upper mandible with the frontal angles short and obtuse, the dorsal line at first sloping, then slightly concave and direct, the ridge broad and flat at the base, then broadly convex, the edges soft, with about fifty internal lamellæ, the unguis roundish, curved abruptly at the end. Nostrils sub-basal, lateral, rather small, oblong, pervious. Lower mandible flattened, its angle very long and narrow, the dorsal line very short, slightly convex, the edges soft, with about sixty lamellæ.

Head of moderate size, oblong, compressed. Neck rather long, slender. Body elongated, slightly depressed. Feet very short; tibia bare for about a quarter of an inch; tarsus very short, compressed, anteriorly with two series of scutella, the outer shorter, the rest covered with reticulated angular scales; toes obliquely scutellate above; first very small, free, with a narrow membrane beneath; third longest, fourth considerably shorter, second shorter than fourth, their connecting webs entire, on the edge crenate; the second or inner toe with a membranous margin. Claws small, slightly arched, compressed, rather acute, the hind one very small and more curved, that of the middle toe with an inner sharp edge.

Plumage dense, soft, blended. Feathers of the head short, of the occiput and nape a little elongated, of the lower parts glossy, with the extremities of the filaments stiffish. Wings rather long, little curved, pointed; the first quill longest, the rest rapidly graduated; secondaries very broad, but pointed, the inner much elongated, and tapering to a point. The tips of the filaments of the outer web of the first primary are separated and curved a little forwards. Tail short, rounded, of sixteen strong pointed feathers, of which the middle pair project considerably.

Bill bluish-black. Iris reddish-hazel. Feet dull orange yellow, claws brownish-black, webs dusky. Head light yellowish-red, the upper part and nape much darker and barred with dusky; the rest dotted with the same. The lower part of the neck, the sides of the body, the fore part of the back, and the outer scapulars, undulated with dusky and yellowish-white, the bands much larger and semicircular on the fore part of the neck and breast; the latter white, the abdomen faintly and minutely undulated with brownish-grey; the elongated scapulars brownish-grey, broadly margined with brownish-red; the hind part of the back brownish-black; the rump all round, and the upper and lower tail-coverts, bluish-black. The anterior smaller wing-coverts are light grey, undulated with dusky, the middle coverts of a deep rich chestnut-red; primary coverts brownish-grey, outer secondary coverts darker and tinged with chestnut, the rest black, excepting the inner, which are grey. Primaries and inner elongated secondaries brownish-grey, of which colour also are the inner webs of the rest, part of the outer webs of five of the outer black, and their terminal margins white, of which colour are the whole outer webs of the three next to the inner elongated quills. Tail brownish-grey, the feathers margined with paler.

Length to end of tail 21$\frac{3}{4}$ inches, to end of wings 19, to end of claws 23$\frac{1}{4}$; extent of wings 35; bill along the ridge 1$\frac{3}{4}$, along the edge of lower mandible 1$\frac{3}{4}$; wing from flexure 11; tail 4$\frac{3}{8}$; tarsus 1$\frac{1}{2}$; hind toe and claw $\frac{1}{2}$; second toe 1$\frac{5}{8}$, its claw $\frac{4}{12}$; third toe 1$\frac{7}{8}$, its claw $\frac{4}{12}$; outer toe 1$\frac{7}{12}$, its claw $\frac{2}{12}$. Weight 1 lb. 10 oz.

Adult Female.

The female is considerably smaller. Bill dusky along the ridge, dull yellowish-orange on the sides. Iris hazel. Feet of a fainter tint than in the male. Upper part of head brownish-black, the feathers edged with light reddish-brown; a streak over the eye, the cheeks, the upper part of the neck all round, light yellowish-red tinged with grey, and marked with small longitudinal dusky streaks, which are fainter on the throat, that part being greyish-white; the rest of the neck, the sides, all the upper parts and the lower rump feathers brownish-black, broadly margined with yellowish-red. Wing-coverts brownish-grey, edged with paler; the wing otherwise as in

the male, but the speculum fainter. Tail-feathers and their coverts dusky, laterally obliquely indented with pale brownish-red, and margined with reddish-white.

Length to end of tail 19¼ inches, to end of wings 18⅝, to end of claws 19½; extent of wings 31; wing from flexure 8¼; tail 3⅝; tarsus 1 1/12; middle toe 1 9/12, its claw 4/12.

In a male, the roof of the mouth is deeply concave, with a prominent median ridge, and oblique grooves toward the end. The tongue is 1 inch 10 twelfths long, fleshy, with a deep longitudinal groove, two lateral series of filaments, and a thin broadly rounded tip, as in other Ducks. The œsophagus, *a*, *b*, is 10½ inches long, 5 twelfths in diameter for about four inches, then enlarged to 10 twelfths, and again contracted as it enters the thorax. The proventriculus, *b b*, is 1 inch and 2 twelfths long, its greatest diameter 8 twelfths. The stomach, *c d e*, is a very large and powerful gizzard, of an elliptical form, compressed, 1 inch and 9 twelfths long, 2 inches in its greatest breadth, or in the direction of the lateral muscles, of which the right, *c*, is 10 twelfths thick, the left, *d*, 9 twelfths. The epithelium is thick and rugous; much thickened and forming two roundish, flat or slightly concave grinding surfaces, opposite the muscles. The intestine, *e f g*, is 6 feet 10 inches long, wide, its diameter for 2 feet being 4½ twelfths, towards the rectum enlarging to 6 twelfths. It forms first a very long duodenal

Nº 78.
Pl. 389.
1.
2.
American Widgeon
1 Male 2 Female
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
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curve, *c e f g*, and is then convoluted or coiled in numerous folds. The rectum is 5¼ inches long; the cœca 11 inches, their greatest diameter 6 twelfths, for 2 inches at the commencement 2 twelfths, toward the end 2½ twelfths, their extremity rounded.

The trachea, *h*, is 7½ inches long; its diameter at the upper part 4 twelfths, gradually diminishing to 3½ twelfths; it then enlarges to 5 twelfths, and contracts to 3½ twelfths at the commencement of the dilatation of the inferior larynx, which is extremely similar to that of the Widgeon, but larger; there being an enlargement, *i*, formed by a number of the lower rings united, and to the left side a rounded bony tympanum, *j*; the greatest transverse diameter of this part, from *i* to *j*, is 1 inch 1 twelfth. The bronchi, *k k*, are of moderate size, covered with a dense layer of adipose matter.

AMERICAN WIDGEON.

ANAS AMERICANA, *Gmel.*

PLATE CCCLXXXIX.—MALE AND FEMALE.

This lively and very handsome Duck is abundant during winter at New Orleans, where it is much esteemed on account of the juiciness of its flesh, and is best known by the name of *Zinzin*. In the Western Country, and in most parts of the Eastern and Middle States, it is called the *Bald Pate*. Early in September it enters the United States by their northern extremities, as well as from Texas; and in both these regions it is now well known to breed in nearly equal numbers. Those which retreat south-westward remain along the coast and in the interior of the Floridas, as well as all that portion of the Gulf of Mexico extending to the mouths of the Mississippi, where they remain until the latter part of April, sometimes even until the middle of May, as they have but a comparatively short journey to perform in order to arrive in Mexico in time to breed. On the coast of the Atlantic they keep in the marshes in company with various species of the same family, being in a manner indifferent as to their associates. During early spring, in Louisiana, they are often seen alighted on extensive plains that have very little water on them.

While advancing along the shores of the Gulf of Mexico, in April, 1837, I and my party observed this species in considerable numbers; and during the whole of our stay in Texas, we daily saw and very frequently procured Widgeons. There they were found in ponds of brackish water, as well as in the fresh-water streams. Before we left that country they were all paired, and I was informed by the Honourable M. FISHER, Secretary to the Texan Navy, that a good number of them breed in the maritime districts, along with several other Ducks, and that he annually received many of the young birds. Their manners at this time fully proved the correctness of the statements of all those who spoke to me on this subject. Indeed my opinion is that some of these birds also propagate in certain portions of the most southern districts of the Floridas, and in the Island of Cuba, as I have seen Widgeons in the peninsula in single pairs, in the beginning of May.

Their retrograde movements in spring, like those of other species, depend much upon the temperature or the advance of the season; and those which proceed northward set out on their journey much earlier than those which move in the opposite direction, the former departing from the middle of March to the 20th of April. Their first appearance on the waters of the Ohio takes place late in September or early in October, when they at once throw themselves into the ponds of the interior, and there remain until the waters are closed by ice, scarcely any betaking themselves to the rivers, unless to repose on the sand-bars. They are there, however, less abundant than nearer the sea-coast, and usually associate with Pintails and Teals, but rarely with Mallards or Dusky Ducks. Whilst in those retired ponds of the forest, from one to another of which they roam in quest of food, they are less noisy than most other species, even than the Pintails, and in this respect resemble the Blue-winged Teals, whose notes are feeble and delicate. Those of the Widgeon are a soft whistle, somewhat similar to the word *sweet*, enunciated as if produced by a flute or a hautboy, and in my judgment not at all like the *hew hew* spoken off by WILSON. They are less shy in those retired places than most species, or are to appearance less aware of the danger of allowing the sportsman to approach them.

In feeding they immerse their neck and the anterior part of the body, generally swimming closer together than other Ducks, in consequence of which habits they are easily neared and often shot in great numbers at a single discharge. During their stay in those districts they feed on the roots and seeds of grasses, water-insects, beech-nuts, small fry, and leeches, and are not so delicate as an article of food as those procured in the rice-fields of South Carolina, or in the plantations of Louisiana and Florida. On their return in spring (for in mild winters they remain all the season in Kentucky), they generally continue until the end of April, and usually pair

before they depart; which induces me to believe that numbers of them breed within the northern limits of the United States, although I have not heard of any having actually been seen doing so.

On the lakes near New Orleans, as well as on the Chesapeake, they are not unfrequently found in company with the Canvass-back Ducks. WILSON mentions their being partially supplied with food by the industry of the latter; but they manage very well in most parts without such assistance. When in full security, the Bald-pates feed at all hours of the day; but in thickly inhabited parts of the country, they usually seek for food at night or early in the morning.

The flight of this species is rather swift, well sustained, and accompanied by the whistling sound of the wings usual in birds of this family. They move in flocks of moderate size, and without much care as to the disposition of their ranks, being sometimes extended into a front line, sometimes in single file, frequently mingled confusedly, and flying at a moderate height, whether over the land or over the water. When they are first started, they fly almost perpendicularly, in a hurried and rather irregular manner. They walk prettily and with ease. After heavy falls of rain in our Southern States, they often alight in the corn-fields, in company with other Ducks, where the ploughed earth, being quite moist and soft, yields them an abundant supply of worms and insects, as well as grains of corn, peas, and other equally nutritious substances.

Dr. RICHARDSON informs us that this species breeds in the woody districts of the Fur Countries, up to their most northern limits, in latitude 80°; and Mr. TOWNSEND states that it is abundant on the Columbia river; but he has not furnished me with any account of its breeding, and I have not had an opportunity of observing it during the season of propagation, as I left Texas without having found a nest or young.

AMERICAN WIDGEON, *Anas americana*, Wils. Amer. Orn., vol. viii. p. 86.
ANAS AMERICANA, Bonap. Syn., p. 384.
MARECA AMERICANA, *Steph. American Widgeon*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 445.
AMERICAN WIDGEON, *Anas Americana*, Nutt. Man., vol. ii. p. 389.
AMERICAN WIDGEON, *Anas Americana*, Aud. Orn. Biog., vol. iv. p. 337.

Male, 20½, 34½. Female, 18, 30.

Breeds in Texas, and in the Northern Districts. Abundant in the south and west in winter. Columbia river. Middle Atlantic districts in autumn and spring.

Adult Male.

Bill nearly as long as the head, deeper than broad at the base, depressed

towards the end, the sides nearly parallel, the tip rounded. Upper mandible with the frontal angles short and obtuse, the dorsal line at first sloping, then concave, at the end decurved, the ridge broad and flat at the base, then broadly convex, the edges soft, with about fifty-five internal lamellæ, the unguis obovate, curved abruptly at the end. Nostrils sub-basal, lateral, near the ridge, oblong, pervious. Lower mandible flattened, its angle very long and rather narrow, the dorsal line very short, slightly convex, the edges soft, with about seventy lamellæ.

Head of moderate size, oblong, compressed. Neck rather long, slender. Body elongated and slightly depressed. Feet very short; tibia bare for about a quarter of an inch; tarsus very short, compressed, anteriorly with two series of scutella, the outer shorter, the rest covered with reticulated angular scales; toes obliquely scutellate above; first very small, free, with a narrow membrane beneath; third longest, fourth considerably shorter, second shorter than fourth; their connecting webs entire, on the edge crenate; the second or inner toe with a membranous margin. Claws small, slightly arched, compressed, rather acute; the hind one very small and more curved, that of the middle toe curved outwards, and having the inner edge dilated.

Plumage dense, soft, blended. Feathers of the head and upper neck oblong, small, those along the crown and occiput longer; of the lower parts ovate, glossy, with the extremities of the filaments stiffish. Wings rather long, little curved, narrow, pointed; the first quill longest, the next scarcely shorter, the rest rapidly graduated; secondaries very short, broad, obliquely rounded; the inner elongated and tapering; the tips of the filaments of the outer web of the first primary are separated and curved a little outwards. Tail short, rounded and pointed, of sixteen feathers, of which the middle pair are more pointed and project considerably.

Bill light greyish-blue, with the extremity including the unguis, and a portion of the margins, black. Iris hazel. Feet light bluish-grey, the webs darker, the claws dusky. The upper part of the head is white, more or less mottled with dusky on its sides; the loral space and cheeks reddish-white, dotted with greenish-black; a broad band from the eye to behind the occiput deep green. The lower part of the hind neck, the scapulars, and the fore part of the back, are minutely transversely undulated with brownish-black and light brownish-red; the hind part similarly undulated with blackish-brown and greyish-white. The smaller wing-coverts are brownish-grey; the primary quills and coverts dark greyish-brown; the secondary coverts white, tipped with black. The speculum is duck-green anteriorly, bounded by the black tips of the secondary coverts, black behind, internally black, with white streaks, the inner elongated secondaries having their outer webs black, margined with white, their inner webs brownish-grey. The tail-

feathers are light brownish-grey. The throat is brownish-black; the lower part of the neck in front, and the fore part of the breast, light brownish-red; the breast, belly, and sides of the rump, white; the sides of the body finely undulated with white and dusky; the rump beneath and the lower tail-coverts black.

Length to end of tail 20½ inches, to end of claws 21; extent of wings 34½; bill to frontal processes 1$\frac{7}{12}$, along the edge of lower mandible 1$\frac{7}{12}$; wing from flexure 11; tail 4½; tarsus 1$\frac{7}{12}$; hind toe $\frac{4}{12}$, its claw $\frac{2}{12}$, middle toe 1$\frac{8}{12}$; its claw $\frac{4}{12}$. Weight 1 lb. 14 oz.

Adult Female.

The female is considerably smaller. The bill, feet, and iris are coloured as in the male. The head and upper part of the neck all round, are white or reddish-white, longitudinally streaked with brownish-black, the top of the head transversely barred; the lower part of the neck in front and behind, the fore part of the back, and the scapulars, are blackish-brown, the feathers broadly margined with brownish-red, and barred with the same, the bars on the back narrow; the hind part of the back dusky; the upper tail-coverts barred with white. The wings are greyish-brown; the secondary coverts tipped with white; the secondary quills are brownish-black, the inner greyish-brown, all margined with white. The tail-feathers are greyish-brown, margined with white. All the lower parts are white, excepting the feathers of the sides, and under the tail, which are broadly barred with dusky and light reddish-brown.

Length to end of tail 18 inches, to end of claws 19½; extent of wings 30; bill along the ridge 1$\frac{6}{12}$; wing from flexure 9$\frac{8}{12}$; tail 8$\frac{2}{12}$; tarsus 1$\frac{4}{12}$; middle toe 1$\frac{9}{12}$, its claw $\frac{3}{12}$. Weight 1 lb. 5 oz.

A very great diversity of colouring exists in this species, which, however, is not yet properly understood. Although males are often found as described above, and as represented in the plate, others have a very different appearance. Thus, an individual shot at the mouth of the Mississippi, in the beginning of April, 1837, has the head and neck brownish-orange, the feathers all minutely tipped with dark green, the lower fore neck lilac; all the upper parts finely undulated with white and dusky, as are the sides; the wing-coverts light brownish-grey; the other parts as described above, but the upper tail-coverts black at the end. In some individuals the top of the head is reddish-white, in others light red, in others pure white; in some, most of the smaller wing-coverts are white, in others grey or brownish-grey; in some the throat is whitish, in others black. These differences, no doubt, depend upon age and season.

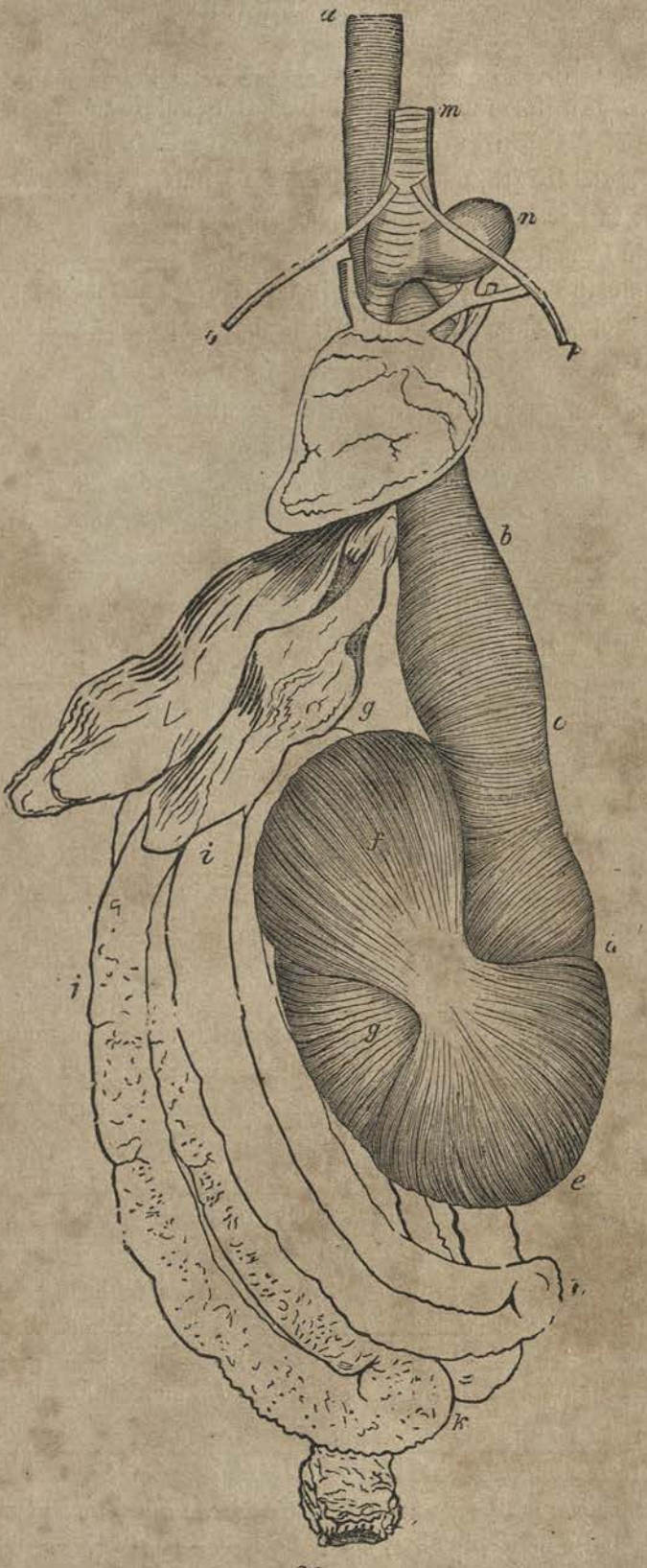
The American Widgeon has been considered distinct from the European; not on account of any difference in size or form, or texture of plumage, but

because it has in certain stages a green band on the side of the head, which the European bird is said not to have. The mirror is the same in both; the wing-coverts are white or grey in both; the crown is white, or cream-coloured, or orange-brown, in both; but in the European the head and neck are described as reddish-chestnut, and in the American as yellowish-white. Now, in fact, American birds sometimes have the head and neck red, and European birds sometimes have the green streak on the side of the head. In short, on comparing specimens from America, with others from India and Norway, I cannot perceive any essential difference. At the same time, not having traced our Widgeon through all its gradations, and being equally unacquainted with all those of the European and Asiatic Widgeon, I cannot *positively* affirm that *Anas Americana* is identical with *Anas Penelope*.

A male preserved in spirits presents the following characters.

The roof of the mouth is deeply concave, with a median prominent line, and numerous irregular small tubercles on the sides, with several larger ones at the fore part. Two large branches of the supra-maxillary nerve run in this ridge, as in other Ducks. The tongue is 1 inch 5 twelfths long, with numerous straight, pointed papillæ at the base, a median longitudinal groove, and a thin broadly rounded point. The œsophagus, *a b c d*, is 10 inches long, narrow, dilating a little on the lower part of the neck, where its diameter is ½ inch. The proventriculus, *b c*, is 8 twelfths broad; its glands oblong, 2 twelfths in length, and occupying a belt 1 inch 4 twelfths in breadth. The gizzard, *e f g*, is extremely large, of a nearly regular elliptical form, placed obliquely, its length 1 inch 8 twelfths, its breadth 2½ inches; its lateral muscles extremely large, the left, *e*, 1 inch 2 twelfths in thickness, the other, *f*, 1 inch and 1 twelfth; the inferior muscle, *g*, only 1 twelfth. In the œsophagus are contained slender leaves of grasses; in the gizzard some of these leaves and other vegetable matters, small seeds, and a great quantity of sand. The cuticular lining or epithelium is dense, slightly rugous, much thickened on the spaces opposite the middle of the lateral muscles. The duodenum, *g h i*, is 5½ inches in its first curve, *g h*, and is then reflected for 7 inches, passes backwards under the kidney and forms several convolutions. The intestine, *g h i j k l*, is 6 feet 2 inches long, ½ inch in diameter in its duodenal portion, gradually contracts to 4 twelfths at the distance of 18 inches from the pylorus, again enlarges to 5 twelfths, and near the rectum to 7 twelfths. The rectum is 4½ inches long; the cœca 8 inches, their diameter for nearly 2 inches being 2 twelfths, after which they are enlarged, their greatest diameter being 4 twelfths. The liver is large, the right lobe being 3½ inches long, the left 2½.

The trachea, *m*, is 7½ inches long, of moderate diameter, the rings roundish and ossified, about 140 in number, its breadth at the top 4½ twelfths,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gradually diminishing to 3 twelfths. At the lower part several of the rings are united so as to form an irregular dilatation, bulging out into a rounded sac, *n*, on the left side, its greatest diameter being 10 twelfths. The bronchi are of moderate length, wide, with about 25 half rings. The contractor muscles are rather strong; and besides the sterno-tracheals, *o p*, there is a pair of cleido-tracheals.

In a female, the gizzard is 2 inches in its greatest diameter; the intestine is 5 feet 2 inches long. The contents of the œsophagus and stomach as in the male.

THE PINTAIL DUCK.

ANAS ACUTA, *Linn.*

PLATE CCCXC.—MALE AND FEMALE.

The first observation that I made on arriving at Labrador, was that no species of Ducks, excepting those which were entirely or chiefly oceanic, seemed to resort to that coast, and I left the country with the same impression. We saw no Mallards, Teals, Widgeons, or Wood Ducks there; nor any species of Merganser, excepting the Red-breasted, which is a marine bird. The Pintail Duck, then, was not seen in the parts of that country which I visited; nor was it known in Newfoundland, on the Magdeleine Islands, or in the British province of Nova Scotia, at least along its Atlantic boundaries. In Kentucky and the whole of the Western Country, where it is extremely abundant in early autumn, during winter, and up to a very advanced period in spring, you meet with it wherever its usual food is found. It follows the waters of the Mississippi to New Orleans, is seen westward in the prairies of Oppelousas, and extends to the eastward as far as Massachusetts, beyond which, like the Mallard, it is very seldom seen. Indeed, this species is at all times rare on the sea-coast of America, and must therefore be considered as an inland bird.

The Pintail, which, in the United States, is better known by the name of Sprigtail, arrives on the western waters early in October, sometimes even about the middle of September, the period of its arrival depending on the

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Pintail Duck
Drawn from Nature by J.J. Audubon FRSFLS.
1. Male 2. Female.
Lith^d Printed & Col^d by J. T. Bowen Philad^a

state of the weather, or the appearance of other species, with which it keeps company. Their plumage is in fine condition when they arrive; their tail-feathers are then as long as at any other period, and the whole apparel of the adult birds is as perfect as in the breeding season.

On the water, few birds exhibit more graceful motions than the Pintail Duck. Its delicately slender neck, the beautiful form of its body, and its pointed tail, which it always carries highly raised, distinguish it from the other species with which it may associate. There seems also a kind of natural modesty in it which you do not find in other Ducks, and its notes, which are often heard, are soft and pleasant. That these notes should ever have been compared to those of the Mallard, appears to me very strange—so strange that I am tempted to believe that they who say so must have mistaken Mallards for Pintails.

Whilst with us, the Pintail is found in company with the Baldpate or American Widgeon, the Blue-winged Teal, and the Mallard, more frequently on ponds than on streams, although it sometimes resorts to the latter, when their shores are overhung with beech-trees loaded with their nutritious fruits, of which this species is extremely fond, and in search of which they even ramble to a short distance into the woods. Were this Duck to feed entirely on beech-nuts, I have no doubt that its flesh would be excellent. It feeds on tadpoles in spring, and leeches in autumn, while, during winter, a dead mouse, should it come in its way, is swallowed with as much avidity as by a Mallard. To these articles of food it adds insects of all kinds, and, in fact, it is by no means an inexpert fly-catcher.

The Pintails are less shy in the Western Country than most species of their family, and in this respect they resemble the Blue-winged Teals, which in fact might be called stupid birds with as much propriety as many others. They swim rather deeply, keep close together, and raise the hind part of the body like the Mallards; and on the water, on land, or on the wing, several may generally be killed at a shot. A friend of mine killed nineteen with two shots of his double-barrelled gun. They are scarcely nocturnal, but rest much in the middle of the day, basking in the sunshine whilst on the water, whenever they can indulge in this luxury. While on ponds, they feed along the most shallow parts, or by the edges; and if you take my advice, you will never shoot at them while their heads are at the bottom, and their feet kicking above water. I have several times, for diversion, done so, but in no instance did I damage a single individual. But when they raise their heads, you may commit great havoc among them.

During heavy rains in winter, or after them, the Pintails are fond of alighting on our broad prairies, corn-fields, and meadows; and in almost every puddle you may then find them busily engaged. They move over

the ground as swiftly as Wood Ducks, still carrying their tail erect, unless when seizing an insect that is on wing or resting on a blade of grass. I knew a particular spot in a corn-field, not many miles from Bayou Sara in Louisiana, where, even after a shower, I was sure to meet with this species, and where I could always have procured a good number, had I thought them likely to be prized at the dinner table. While I was at General HERNANDEZ's in Florida, the Pintails were very numerous. They alighted everywhere, and I shot a few in order to satisfy myself that they were of the same species as those I had been accustomed to see. On one occasion I shot at a large flock swimming on a shallow pond in a large savannah, and wounded several, which I was surprised to see diving very expertly as I waded out for them, this species being by no means addicted to that practice. Those which I have now and then wounded, while in a boat and in deep water, soon gave up diving, and surrendered, without exhibiting any of those feats of cunning performed by other species.

The flight of the Pintails is very rapid, greatly protracted, and almost noiseless. They arrive in the Western Country mostly in the dusk of evening, and alight without much circumspection wherever they find water. They remain at night in the ponds where they feed, and continue there generally unless much disturbed. On such occasions they keep in the middle of the water, to avoid their land enemies; but the Virginian and Barred Owls not unfrequently surprise them, and force them to rise or make towards the shore, when they fall a prey to the nocturnal marauders. In the Middle States, they are highly esteemed for the table. There they arrive later and retire sooner towards their breeding-places, than in the country west of the Alleghany Mountains.

PINTAIL DUCK, *Anas acuta*, Wils. Amer. Orn., vol. viii. p. 72.
ANAS ACUTA, Bonap. Syn., p. 383.
ANAS CAUDACUTA, *Pintail Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 441.
PINTAIL or WINTER DUCK, *Anas acuta*, Nutt. Man., vol. ii. p. 386.
PINTAIL DUCK, *Anas acuta*, Aud. Orn. Biog., vol. iii. p. 214; vol. v. p. 615.

Male, 29, 36. Female, 22½, 34.

From Texas, throughout the interior, to the Columbia river, and along the Atlantic coast to Maine, during winter and early spring. Breeds in the Arctic regions. Abundant.

Adult Male.

Bilt nearly as long as the head, deeper than broad at the base, depressed towards the end, the frontal angles short and obtuse. Upper mandible with the dorsal line at first sloping, then concave, towards the curved unguis nearly straight, the ridge broad and flat at the base, then broadly convex,

the sides convex, the edges soft, with about fifty internal lamellæ; unguis small, somewhat triangular, curved abruptly at the broad end. Nostrils sub-basal, lateral, rather small, oval, pervious. Lower mandible flattish, its angle very long and narrow, the dorsal line very short, slightly convex, the sides convex, the edges soft, with about sixty lamellæ.

Head of moderate size, compressed, the forehead rounded. Neck rather long and slender. Body full and depressed. Wings rather small. Feet very short, placed rather far back; tarsus very short, compressed, at its lower part anteriorly with two series of scutella, the rest covered with reticulated angular scales. Toes obliquely scutellate above; first very small, free, with a narrow membrane beneath; third longest; fourth a little shorter, their connecting webs entire, reticulated, at the edge pectinate; claws small, curved, compressed, acute, the hind one smaller and more curved, that of the third toe with an inner sharp edge.

Plumage dense, soft, blended. Feathers of the head and neck short, on the hind head and neck elongated. Wings narrow, of moderate length, acute, the first quill longest, the second nearly equal, the rest rapidly graduated; outer secondaries broad and rounded; inner elongated and tapering, as are their coats, and the scapulars; first quill serrated on the outer edge, somewhat like that of an Owl. Tail of moderate length, tapering, of fourteen tapering feathers, of which the two middle project far beyond the rest.

Bill black, the sides of upper mandible light blue. Iris brown. Feet greyish-blue; claws black. Head, throat, and upper part of neck anteriorly greenish-brown, faintly margined behind with purplish-red; a small part of hind neck dark green; the rest, and the upper parts in general, beautifully undulated with very narrow bars of brownish-black and yellowish-white; smaller wing-coverts, alula, and primary quills grey, the latter dark brown towards the end; the speculum of a coppery-red, changing to dull green, edged anteriorly with light brownish-red, posteriorly with white; the inner secondaries, and the scapulars, black and green, with broad grey margins. Upper tail-coverts cream-coloured, the outer webs blackish and green; tail light grey, the middle feathers dark brown, glossed with green. On each side of the neck is an oblique band of white, of which colour are the under parts in general, the sides, however, undulated like the back; the lateral feathers of the rump cream-coloured, the lower tail-coverts black, those at the sides edged with white.

Length to end of tail 29 inches; extent of wings 36; bill along the back $2\frac{2}{12}$, along the edge of lower mandible $2\frac{3}{12}$; tarsus $1\frac{8}{12}$, middle toe 2, its claw $\frac{4}{12}$; wing from flexure 11, tail 5½. Weight 2 lbs.

Adult Female.

The female, which is much smaller, has the upper parts variegated with

brownish-black and light yellowish-brown, the margin of the feathers, and a mark on each side of the shaft being of the latter colour; the speculum is dusky-green, margined behind with white; the primary quills greyish-brown. The lower parts are of a light brownish-yellow, the sides variegated with brown; the bill is black, the iris brown, the feet light bluish-grey.

Length 22½ inches, extent of wings 34. Weight 1 lb. 9 oz.

Male. Width of mouth 8 twelfths; its roof very deeply concave, with a medium prominent line, on which are 8 papillæ; the lamellæ on the upper mandible 50, and not reaching the margin; those on the upper edge of the lower mandible about 116. Tongue 2 inches 1 twelfth long, fleshy, prominent at the base, with a narrow median groove, thinner and broadly channelled toward the end, the edge thin and bristled, with 6 large papillæ toward the base, on each side, the tip somewhat semicircular, very thin, and horny. Œsophagus 11 inches long, 4 twelfths in width, at the lower part of the neck dilated to 8 twelfths, then contracting to 4 twelfths; the proventriculus 8 twelfths in breadth. The stomach a very muscular oblique gizzard, 1 inch 11 twelfths in breadth, 1 inch 4 twelfths long, the right muscle 9 twelfths, the left 11 twelfths thick; the epithelium with two very thick concave grinding plates. Intestine 4 feet long, its average width 4 twelfths; cœca 4 inches 9 twelfths long, their greatest width 2 twelfths, narrow at the commencement and toward the end, 3 inches from the extremity. Liver with the right lobe 2 inches 8 twelfths long. The left 2 inches; gall-bladder 1 inch long, 5½ twelfths broad.

Trachea 8½ inches long, narrow at the commencement, its breadth being 2½ twelfths, gradually enlarging to 4½ twelfths; then contracting to 3 twelfths, and terminating in a transversely oblong bony dilatation, projecting on the left side, with a rounded bulge similar to that of the Dusky Duck and Teal. The rings are firm, 140, besides about 8 which are blended with the tympanum. Bronchial half rings 22 and 26. Muscles as usual.

Wood Duck Summer Duck

(Male 2 Female

Drawn from Nature by J.J.Audubon, F.R.S.F.L.S. Lith.d Printed & Col.d by J.T.Bowen, Phil.a P.a

THE WOOD DUCK.—SUMMER DUCK.

ANAS SPONSA, *Linn.*

PLATE CCCXCI.—MALES AND FEMALES.

I have always experienced a peculiar pleasure while endeavouring to study the habits of this most beautiful bird in its favourite places of resort. Never on such occasions have I been without numberless companions, who, although most of them were insensible of my presence, have afforded me hours of the never-failing delight resulting from the contemplation of their character. Methinks I am now seated by the trunk of a gigantic sycamore, whose bleached branches stretch up towards the heavens, as if with a desire to overlook the dense woods spread all around. A dark-watered bayou winds tortuously beneath the maples that margin its muddy shores, a deep thicket of canes spreading along its side. The mysterious silence is scarcely broken by the hum of myriads of insects. The blood-sucking musquito essays to alight on my hand, and I willingly allow him to draw his fill, that I may observe how dexterously he pierces my skin with his delicate proboscis and pumps the red fluid into his body, which is quickly filled, when with difficulty he extends his tiny wings and flies off, never to return. Over the withered leaves many a tick is seen scrambling, as if anxious to elude the searching eye of that beautiful lizard. A squirrel spread flat against a tree, with its head directed downwards, is watching me; the warblers, too, are peeping from among the twigs. On the water, the large bull-frogs are endeavouring to obtain a peep of the sun; suddenly there emerges the head of an otter, with a fish in its jaws, and in an instant my faithful dog plunges after him, but is speedily recalled. At this moment, when my heart is filled with delight, the rustling of wings comes sweeping through the woods, and anon there shoots overhead a flock of Wood Ducks. Once, twice, three times, have they rapidly swept over the stream, and now, having failed to discover any object of alarm, they all alight on its bosom, and sound a note of invitation to others yet distant.

Scenes like these I have enjoyed a thousand times, yet regret that I have not enjoyed them oftener, and made better use of the opportunities which I have had of examining the many interesting objects that attracted my notice. And now, let me endeavour to describe the habits of the Wood Duck, in so far as I have been able to apprehend them.

This beautiful species ranges over the whole extent of the United States, and I have seen it in all parts from Louisiana to the confines of Maine, and from the vicinity of our Atlantic coasts as far inland as my travels have extended. It also occurs sparingly during the breeding-season in Nova Scotia; but farther north I did not observe it. Everywhere in this immense tract I have found it an almost constant resident, for some spend the winter even in Massachusetts, and far up the warm spring waters of brooks on the Missouri. It confines itself, however, entirely to fresh water, preferring at all times the secluded retreats of the ponds, bayous, or creeks, that occur so profusely in our woods. Well acquainted with man, they carefully avoid him, unless now and then during the breeding-season, when, if a convenient spot is found by them in which to deposit their eggs and raise their young, they will even locate themselves about the miller's dam.

The flight of this species is remarkable for its speed, and the ease and elegance with which it is performed. The Wood Duck passes through the woods and even amongst the branches of trees, with as much facility as the Passenger Pigeon; and while removing from some secluded haunt to its breeding-grounds, at the approach of night, it shoots over the trees like a meteor, scarcely emitting any sound from its wings. In the lower parts of Louisiana and Kentucky, where they abound, these regular excursions are performed by flocks of from thirty to fifty or more individuals. In several instances I have taken perhaps undue advantage of their movements to shoot them on the wing, by placing myself between their two different spots of resort, and keeping myself concealed. In this manner I have obtained a number in the course of an hour of twilight; and I have known some keen sportsmen kill as many as thirty or forty in a single evening. This sport is best in the latter part of autumn, after the old males have joined the flocks of young led by the females. Several gunners may then obtain equal success by placing themselves at regular distances in the line of flight, when the birds having in a manner to run the gauntlet, more than half of a flock have been brought down in the course of their transit. While passing through the air on such occasions, the birds are never heard to emit a single note.

The Wood Duck breeds in the Middle States about the beginning of April, in Massachusetts a month later, and in Nova Scotia or on our northern lakes, seldom before the first days of June. In Louisiana and Kentucky, where I have had better opportunities of studying their habits in this respect, they generally pair about the 1st of March, sometimes a fortnight earlier. I never knew one of these birds to form a nest on the ground, or on the branches of a tree. They appear at all times to prefer the hollow broken portion of some large branch, the hole of our large Woodpecker (*Picus principalis*), or the deserted retreat of the fox-squirrel; and I have

frequently been surprised to see them go in and out of a hole of any one of these, when their bodies while on wing seemed to be nearly half as large again as the aperture within which they had deposited their eggs. Once only I found a nest (with ten eggs) in the fissure of a rock on the Kentucky river a few miles below Frankfort. Generally, however, the holes to which they betake themselves are either over deep swamps, above cane brakes, or on broken branches of high sycamores, seldom more than forty or fifty feet from the water. They are much attached to their breeding-places, and for three successive years I found a pair near Henderson, in Kentucky, with eggs in the beginning of April, in the abandoned nest of an Ivory-billed Woodpecker. The eggs, which are from six to fifteen, according to the age of the bird, are placed on dry plants, feathers, and a scanty portion of down, which I believe is mostly plucked from the breast of the female. They are perfectly smooth, nearly elliptical, of a light colour, between buff and pale green, two inches in length by one and a half in diameter; the shell is about equal in firmness to that of the Mallard's egg, and quite smooth.

No sooner has the female completed her set of eggs than she is abandoned by her mate, who now joins others, which form themselves into considerable flocks, and thus remain apart until the young are able to fly, when old and young of both sexes come together, and so remain until the commencement of the next breeding season. In all the nests which I have examined, I have been rather surprised to find a quantity of feathers belonging to birds of other species, even those of the domestic fowl, and particularly of the Wild Goose and Wild Turkey. On coming upon a nest with eggs when the bird was absent in search of food, I have always found the eggs covered over with feathers and down, although quite out of sight, in the depth of a Woodpecker's or Squirrel's hole. On the contrary, when the nest was placed in the broken branch of a tree, it could easily be observed from the ground, on account of the feathers, dead sticks, and withered grasses about it. If the nest is placed immediately over the water, the young, the moment they are hatched, scramble to the mouth of the hole, launch into the air with their little wings and feet spread out, and drop into their favourite element; but whenever their birth-place is at some distance from it, the mother carries them to it one by one in her bill, holding them so as not to injure their yet tender frame. On several occasions, however, when the hole was thirty, forty, or more yards from a bayou or other piece of water, I observed that the mother suffered the young to fall on the grasses and dried leaves beneath the tree, and afterwards led them directly to the nearest edge of the next pool or creek. At this early age, the young answer to their parents' call with a mellow *pee, pee, pee*, often and rapidly repeated. The call of the mother at such times is low, soft, and prolonged, resembling

the syllables *pe-ēē, pe-ēē.* The watch-note of the male, which resembles *hoe-ēēk,* is never uttered by the female; indeed, the male himself seldom uses it unless alarmed by some uncommon sound or the sight of a distant enemy, or when intent on calling passing birds of his own species.

The young are carefully led along the shallow and grassy shores, and taught to obtain their food, which at this early period consists of small aquatic insects, flies, musquitoes, and seeds. As they grow up, you now and then see the whole flock run as it were along the surface of the sluggish stream in chase of a dragon-fly, or to pick up a grasshopper or locust that has accidentally dropped upon it. They are excellent divers, and when frightened instantly disappear, disperse below the surface, and make for the nearest shore, on attaining which they run for the woods, squat in any convenient place, and thus elude pursuit. I used two modes of procuring them alive on such occasions. One was with a bag net, such as is employed in catching our little Partridge, and which I placed half sunk in the water, driving the birds slowly, first within the wings, and finally into the bag. In this manner I have caught young and old birds of this species in considerable numbers. The other method I accidentally discovered while on a shooting excursion, accompanied by an excellent pointer dog. I observed that the sight of this faithful animal always immediately frightened the young Ducks to the shores, the old one taking to her wings as soon as she conceived her brood to be safe. But the next instant Juno would dash across the bayou or pond, reach the opposite bank, and immediately follow on their track. In a few moments she would return with a duckling held between her *lips,* when I would take it from her unhurt.

While residing at Henderson, I thought of taming a number of Wood Ducks. In the course of a few days Juno procured for me, in the manner above described, as many as I had a mind for, and they were conveyed home in a bag. A dozen or more were placed in empty flour barrels, and covered over for some hours, with the view of taming them the sooner. Several of these barrels were placed in the yard, but whenever I went and raised their lids, I found all the little ones hooked by their sharp claws to the very edge of their prisons, and, the instant that room was granted, they would tumble over and run off in all directions. I afterwards frequently saw these young birds rise from the bottom to the brim of a cask, by moving a few inches at a time up the side, and fixing foot after foot by means of their diminutive hooked claws, which, in passing over my hand, I found to have points almost as fine as those of a needle. They fed freely on corn-meal soaked in water, and as they grew, collected flies with great expertness. When they were half grown I gave them great numbers of our common locusts yet unable to fly, which were gathered by boys from the trunks of trees and

the "iron weeds," a species of wild hemp very abundant in that portion of the country. These I would throw to them on the water of the artificial pond which I had in my garden, when the eagerness with which they would scramble and fight for them always afforded me great amusement. They grew up apace, when I pinioned them all, and they subsequently bred in my grounds in boxes which I had placed conveniently over the water, with a board or sticks leading to them, and an abundant supply of proper materials for a nest placed in them.

Few birds are more interesting to observe during the love-season than Wood Ducks. The great beauty and neatness of their apparel, and the grace of their motions, always afford pleasure to the observer; and, as I have had abundant opportunities of studying their habits at that period, I am enabled to present you with a full account of their proceedings.

When March has again returned, and the Dogwood expands its pure blossoms to the sun, the Cranes soar away on their broad wings, bidding our country adieu for a season, flocks of water-fowl are pursuing their early migrations, the frogs issue from their muddy beds to pipe a few notes of languid joy, the Swallow has just arrived, and the Blue-bird has returned to his box. The Wood Duck almost alone remains on the pool, as if to afford us an opportunity of studying the habits of its tribe. Here they are, a whole flock of beautiful birds, the males chasing their rivals, the females coquetting with their chosen beaux. Observe that fine drake! how gracefully he raises his head and curves his neck! As he bows before the object of his love, he raises for a moment his silken crest. His throat is swelled, and from it there issues a guttural sound, which to his beloved is as sweet as the song of the Wood Thrush to its gentle mate. The female, as if not unwilling to manifest the desire to please which she really feels, swims close by his side, now and then caresses him by touching his feathers with her bill, and shews displeasure towards any other of her sex that may come near. Soon the happy pair separate from the rest, repeat every now and then their caresses, and at length, having sealed the conjugal compact, fly off to the woods to search for a large Woodpecker's hole. Occasionally the males fight with each other, but their combats are not of long duration, nor is the field ever stained with blood, the loss of a few feathers or a sharp tug of the head being generally enough to decide the contest. Although the Wood Ducks always form their nests in the hollow of a tree, their caresses are performed exclusively on the water, to which they resort for the purpose, even when their loves have been first proved far above the ground on a branch of some tall sycamore. While the female is depositing her eggs, the male is seen to fly swiftly past the hole in which she is hidden, erecting his crest, and sending forth his love-notes, to which she never fails to respond.

On the ground the Wood Duck runs nimbly and with more grace than most other birds of its tribe. On reaching the shore of a pond or stream, it immediately shakes its tail sidewise, looks around, and proceeds in search of food. It moves on the larger branches of trees with the same apparent ease; and, while looking at thirty or forty of these birds perched on a single sycamore on the bank of a secluded bayou, I have conceived the sight as pleasing as any that I have ever enjoyed. They always reminded me of the Muscovy Duck, of which they look as if a highly finished and flattering miniature. They frequently prefer walking on an inclined log or the fallen trunk of a tree, one end of which lies in the water, while the other rests on the steep bank, to betaking themselves to flight at the sight of an approaching enemy. In this manner I have seen a whole flock walk from the water into the woods, as a steamer was approaching them in the eddies of the Ohio or Mississippi. They swim and dive well, when wounded and closely pursued, often stopping at the edge of the water with nothing above it but the bill, but at other times running to a considerable distance into the woods, or hiding in a cane-brake beside a log. In such places I have often found them, having been led to their place of concealment by my dog. When frightened, they rise by a single spring from the water, and are as apt to make directly for the woods as to follow the stream. When they discover an enemy while under the covert of shrubs or other plants on a pond, instead of taking to wing, they swim off in silence among the thickest weeds, so as generally to elude your search, by landing and running over a narrow piece of ground to another pond. In autumn, a whole covey may often be seen standing or sitting on a floating log, pluming and cleaning themselves for hours. On such occasions the knowing sportsman commits great havoc among them, killing half a dozen or more at a shot.

The food of the Wood Duck, or as it is called in the Western and Southern States, the Summer Duck, consists of acorns, beech nuts, grapes, and berries of various sorts, for which they *half-dive*, in the manner of the Mallard for example, or search under the trees on the shores and in the woods, turning over the fallen leaves with dexterity. In the Carolinas, they resort under night to the rice-fields, as soon as the grain becomes milky. They also devour insects, snails, tadpoles, and small water lizards, swallowing at the same time a quantity of sand or gravel to aid the trituration of their food.

The best season in which to procure these birds for the table is from the beginning of September until the first frost, their flesh being then tender, juicy, and in my opinion excellent. They are easily caught in figure-of-four traps. I know a person now residing in South Carolina, who has caught several hundreds in the course of a week, bringing them home in bags across

his horse's saddle, and afterwards feeding them in coops on Indian corn. In that State, they are bought in the markets for thirty or forty cents the pair. At Boston, where I found them rather abundant during winter, they bring nearly double that price; but in Ohio and Kentucky twenty-five cents are considered an equivalent. Their feathers are as good as those of any other species; and I feel well assured that, with a few years of care, the Wood Duck might be perfectly domesticated, when it could not fail to be as valuable as it is beautiful.

Their sense of hearing is exceedingly acute, and by means of it they often save themselves from their wily enemies the mink, the polecat, and the racoon. The vile snake that creeps into their nest and destroys their eggs, is their most pernicious enemy on land. The young, when on the water, have to guard against the snapping-turtle, the gar-fish, and the eel, and in the Southern Districts, against the lashing tail and the tremendous jaws of the alligator.

Those which breed in Maine, New Brunswick, and Nova Scotia, move southward as soon as the frosts commence, and none are known to spend the winter so far north. I have been much surprised to find WILSON speaking of the Wood Ducks as a species of which more than five or six individuals are seldom seen together. A would-be naturalist in America, who has had better opportunities of knowing its habits than the admired author of the "American Ornithology," repeats the same error, and, I am told, believes that all his statements are considered true. For my own part, I assure you, I have seen hundreds in a single flock, and have known fifteen to be killed by a single shot. They, however, raise only one brood in the season, unless their eggs or young have been destroyed. Should this happen, the female soon finds means of recalling her mate from the flock which he has joined.

On having recourse to a journal written by me at Henderson nearly twenty years ago, I find it stated that the attachment of a male to a female lasts only during one breeding season; and that the males provide themselves with mates in succession, the strongest taking the first choice, and the weakest being content with what remains. The young birds which I raised, never failed to make directly for the Ohio, whenever they escaped from the grounds, although they never had been there before. The only other circumstances which I have to mention are, that when entering the hole in which its nest is, the bird dives as it were into it at once, and does not alight first against the tree; that I have never witnessed an instance of its taking possession, by force, of a Woodpecker's hole; and lastly, that during winter they allow Ducks of different species to associate with them.

Dr. BACHMAN, who has kept a male of this species several years, states

that after moulting he is for six weeks of a plain colour, like the young males, and the feathers gradually assume their bright tints.

The tree represented in the plate is the *Platanus occidentalis*, which in different parts of the United States is known by the names of Buttonwood, Sycamore, Plane-tree, and Water Beech, and in Canada by that of Cotton-tree. It is one of our largest trees, and on the banks of our great western and southern rivers often attains a diameter of eight or ten feet. Although naturally inclined to prefer the vicinity of water, it grows in almost every kind of situation, and thrives even in the streets of several of our eastern cities, such as Philadelphia and New York.

Summer Duck or Wood Duck, *Anas sponsa*, Swains. and Rich. F. Bor. Amer., vol. viii. p. 97.

Dendronessa sponsa, *Summer Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 446.

Summer or Wood Duck, *Anas sponsa*, Nutt. Man., vol. ii. p. 394.

Wood Duck, *Anas sponsa*, Aud. Orn. Biog., vol. iii. p. 52; vol. v. p. 618.

Male 20½, 28. Female, 19½.

Breeds throughout the country from Texas to the Columbia, and eastward to Nova Scotia. Fur countries. Accumulates in the Southern Districts in winter.

Adult Male.

Bill shorter than the head, deeper than broad at the base, depressed towards the end, slightly narrowed towards the middle of the unguis, the frontal angles prolonged and pointed. Upper mandible with the dorsal line at first sloping, then concave, along the unguis convex, the ridge broad and flat at the base, then broadly convex, the sides concave and perpendicular at the base, convex and sloping towards the end, edges soft, with about twenty-two internal lamellæ, unguis broadly elliptical, curved, rounded. Nostrils sub-basal, lateral, rather small, oval, pervious. Lower mandible flattish, with the angle very long and rather narrow, the dorsal line very short, convex, the sides convex, the edges soft and rounded, lamellate above.

Head of moderate size, neck rather long and slender, body full and depressed, wings rather small. Feet very short, strong, placed rather far back; tarsus very short, considerably compressed, at its lower part anteriorly with two series of scutella, the rest covered with reticulated angular scales. Toes scutellate above; first very small, free, with a narrow membrane beneath, third longest, fourth a little shorter; claws small, curved, compressed, acute, the hind one smaller and more curved, that of the third toe with an inner sharp edge.

Plumage dense, soft, blended, generally glossed. Feathers of the middle of the head and upper part of hind neck, very narrow, elongated, and in

curved, of the rest of the head and upper part of neck very short, of the back and lower parts in general broad and rounded, excepting on the shoulders before the wings, where they are enlarged, very broad and abrupt. Wings of moderate length, narrow, acute; primaries curved, strong, tapering, first and second longest; secondaries broad, rounded. Tail of moderate length, rather broad, much rounded, of sixteen rounded feathers.

Upper mandible bright red at the base, pale yellow on the sides, the intermediate space along the ridge, and the unguis, black, as in the lower mandible and its membrane. Iris and edges of eyelids bright red. Feet dull orange, claws black. Upper part of head, and space between the bill and eye, deep green, and highly glossed; below the latter space a patch of dark purple, and a larger one of the same colour, but lighter, behind the eye; sides of the neck, its hind part under the crest, and the middle all round very dark purple. A narrow line along the base of the upper mandible and over the eye, meeting on the occiput, pure white, as are some of the feathers of the crest; another from behind the eye, meeting below the occiput, and including several of the lower elongated feathers. Throat, for more than three inches, pure white, with a process on each side a little beyond the eye, and another nearly halfway down the neck. Sides of the neck, and its lower part, anteriorly reddish-purple, each feather on the latter with a triangular white tip. Middle of the neck behind, back and rump, very dark reddish-brown, the latter deeper, and tinged with green; upper tail-coverts and tail greenish-black; some of the lateral tail-coverts dull reddish-purple, a few on either side with their central filaments light red. Smaller wing-coverts, alula and primaries, dull greyish-brown; most of the latter with part of their outer web greyish-white, and their inner towards the end darker and glossed with green. Secondary quills tipped with white, the outer webs green, with purple reflections, those of the inner secondaries and scapulars velvet-black, their inner webs partially glossed and changing to green. The broad feathers anterior to the wings are white, terminated with black; breast and abdomen greyish-white; feathers under the wings yellowish-grey, minutely undulated with black and white bars; lower wing-coverts and axillar feathers white, barred with greyish-brown; lower tail-coverts dull greyish-brown.

Length 20½ inches, to end of claws 17½, extent of wings 28; bill 1 5/12; tarsus 1 5/12, middle toe and claw 2 5/12; wing from flexure 9; tail 4¼.

Adult Female.

The female is considerably smaller, and differs greatly from the male in colouring. The feathers of the head are not elongated, but those of the upper part of the neck behind are slightly so. In other respects the plumage presents nothing very remarkable, and is similar to that of the male, only

the feathers anterior to the wing, the upper hypochondrial, the inner secondaries and the rump-feathers are not enlarged, as in him. Bill blackish-brown; feet dusky, tinged with yellow. Upper part of head dusky, glossed with green, sides of the head and neck, with the hind part of the latter, light brownish-grey; throat white, but without the lateral processes of the male. Fore part of neck below and sides light yellowish-brown, mottled with dark greyish-brown, as are the sides under the wings; breast and abdomen white, the former spotted with brown. Hind neck, back, and rump, dark brown, glossed with green and purple. Wings as in the male, but the speculum less, and the secondaries externally faint reddish-purple, the velvet black of the male diminished to a few narrow markings. Tail dark brown, glossed with green; lower tail-coverts pale greyish-brown, mottled with white; lower wing-coverts as in the male.

Length 19½ inches.

Male. Width of mouth 8 twelfths; the upper mandible is widely concave, with a prominent line, on which are a few papillæ; there are about 30 lamellæ on each side of the upper mandible, of which only five about the middle project beyond the margin, on the edge of the lower are 35. The tongue is fleshy, 1 inch 5 twelfths long, papillate at the base, contracted toward the middle, the edges thin and lamellate, the tip semicircular, thin, and horny. Œsophagus 8½ inches long, its width uniformly 10 twelfths; the proventriculus 4 inches in breadth. The stomach is a very large muscular gizzard of a transversely elliptical form, placed obliquely, 1 inch 5 twelfths long, 1 inch 8½ twelfths broad; the lateral muscles very thick, and forming a singularly thin edge; the tendons covering the whole surface; the left muscle 7 twelfths thick, the right 8 twelfths; the epithelium very thick, dense, with two elliptical grinding surfaces. Proventricular belt 1 inch 5 twelfths in breadth. Lobes of the liver 1 inch 8 twelfths, and 2 inches 8 twelfths long. Intestine 37 inches long, for a short space at the commencement its width is 4 twelfths, but presently contracts to 2½ twelfths, and ultimately to 2 twelfths, being more slender than that of any other species of this family examined. The cœca are 2¼ inches long, 1½ twelfths in width, and placed at the distance of 3½ inches from the extremity.

Trachea 6½ inches long, much flattened, of the uniform width of 3 twelfths; its rings rather firm, 120 in number, of which about 15 at the lower part are extremely narrow and distant in front. There is an irregular transverse bony ovate dilatation, 10 twelfths in breadth, 6 twelfths in length, with its greatest protuberance to the left side, as is usual. Bronchi of moderate length, the left of 28, the right of 30 half rings. There are no inferior laryngeal muscles, and both the sterno-tracheals come off on the right side, the left one winding behind the right end of the tympanum.

N° 79

Pl. 392

American Green winged Teal

(Male 2 Female)

Drawn from Nature by J.J. Audubon F.R.S.F.L.S

Lith.d Printed & Col.d by J.T. Bowen Philad.a

AMERICAN GREEN-WINGED TEAL.

ANAS CAROLINENSIS, *Steph.*

PLATE CCCXCII.—MALE AND FEMALE.

Nothing can be more pleasing to an American sportsman, than the arrival of this beautiful little Duck in our Southern or Western States. There, in the month of September, just as the sun sinks beneath the horizon, you may find him standing on some moat or embankment of a rice-field in Carolina, or a neck of land between two large ponds in Kentucky, his gun loaded with number four, and his dog lying at his feet. He sees advancing from afar, at a brisk rate, a small dark cloud, which he has some minutes ago marked and pronounced to be a flock of Green-winged Teals. Now he squats on his haunches; his dog lies close; and ere another minute has elapsed, right over his head, but too high to be shot at, pass the winged travellers. Some of them remember the place well, for there they have reposed and fed before. Now they wheel, dash irregularly through the air, sweep in a close body over the watery fields, and in their course pass near the fatal spot where the gunner anxiously awaits. Hark, two shots in rapid succession! The troop is in disorder, and the dog dashes through the water. Here and there lies a Teal, with its legs quivering; there, one is whirling round in the agonies of death; some, which are only winged, quickly and in silence make their way towards a hiding-place, while one, with a single pellet in his head, rises perpendicularly with uncertain beats, and falls with a splash on the water. The gunner has charged his tubes, his faithful follower has brought up all the game, and the frightened Teals have dressed their ranks, and flying now high, now low, seem curious to see the place where their companions have been left. Again they fly over the dangerous spot, and again receive the double shower of shot. Were it not that darkness has now set in, the carnage might continue until the sportsman should no longer consider the thinned flock worthy of his notice. In this manner, at the first arrival of the Green-winged Teal in the Western Country, I have seen upwards of six dozen shot by a single gunner in the course of one day.

I have often thought that water-birds, Ducks for example, like land-birds which migrate in flocks, are very apt to pass over the place where others of the same kind had been before. Pigeons, Starlings, Robins, and other land-

birds are often observed to do so; while Gulls, Cormorants, Plovers, Ducks, and Geese, are similar in this respect. The first object in view with such species is to remove from one part of the country to another, as every one knows; and as to reach a place of safety abundantly supplied with food, is the next object, you may perhaps join me in concluding, that, to the spot or district in which birds have once been and spent a season, they are ever afterwards inclined to return. Well, the Green-wings are known to follow each other in flocks, sometimes consisting of a few families, sometimes of many hundred individuals, particularly in autumn, when old and young leave the north to avoid the rigours of its dreary winter. In spring, again, many species both of land and water birds perform their migrations, either singly or in smaller groups, the males departing before the females, and in some cases the young keeping by themselves, an arrangement perhaps intended for the greater dispersion of the species.

In Louisiana, the Green-winged Teal is named *Sarcelle d'hiver*, while the Blue-winged species bears the name of *Sarcelle d'été*, although the latter remains only some weeks in that country after the departure of the former. Its general name, however, is the "Green-wing;" and a poor name in my opinion it is, for the bird has not more green on its wings than several other species have. Indeed, very many birds are strangely named, not less in *pure* Latin, than in English, French, and Dutch; and very many are every year receiving names still stranger than those they bore. For my part, I am at present a kind of conservative, and adhere to the old system until I see the mud raised up by the waders subside, when I may probe my way with more chance of success.

The Green-winged Teal is a fresh-water bird, being rarely met with in marine bays, creeks, or lagoons, where, however, it may sometimes spend a few days. It is accordingly enabled to feed with its body half immersed, in the manner of the Mallard and several other species, for which purpose it is furnished with a comparatively long neck. Its food consists principally of the seeds of grasses, which are collected either when floating or when still adhering to their stalks, small acorns, fallen grapes or berries, as well as aquatic insects, worms, and small snails. I have never found water lizards, leeches, fishes, or even tadpoles in their gizzards. The food of this bird being thus more select than that of most other Ducks, its flesh is delicious, probably the best of any of its tribe; and I would readily agree with any epicure in saying, that when it has fed on wild oats at Green Bay, or on soaked rice in the fields of Georgia and the Carolinas, for a few weeks after its arrival in those countries, it is much superior to the Canvass-back in tenderness, juiciness, and flavour. Indeed, the Green-wing is as much superior to the Canvass-back, as the European Quail is to the Capercailzie,

or the Sora of the Delaware to the Scolopaceous Courlan of the Florida everglades.

On land, the Green-wing moves with more ease and grace than any other species with which I am acquainted, excepting our beautiful Wood Duck. It can run at a good rate, without entangling its webbed feet, as many others do; and in this, too, there is a marked difference between fresh-water and salt-water Ducks, as one may very readily perceive. On the water, also, it moves with great ease, at times with considerable rapidity, and when not severely wounded, is able to dive in a very creditable manner. On wing it has no rivals among Ducks. Our two smaller Mergansers, however, are swifter, although they exhibit none of the graceful movements every now and then shown by the Green-wings, when coursing in the air over and around a pond, a river, or a large wet savannah. They rise from the water at a single spring, and so swiftly, too, that none but an expert marksman need attempt to shoot them, if when starting they are many yards distant. While feeding, they proceed in a close body along the shores, or wherever the water is so shallow that they can reach the bottom with ease. In savannahs or watery fields intersected by dry ridges, they remove from one pool to another on foot, unless the distance is considerable; and in effecting the transit, they run so huddled together, as to enable a gunner to make great havoc among them. When the cravings of hunger are satisfied, they retire to some clean part of the shore, or a sand-bar, where they rest in perfect harmony, each individual composing its dress, and afterwards, with wings slightly drooping, placing its breast to the sun. There they remain for an hour or more at a time, some sound asleep, some dozing, but rarely without a trusty sentinel watching over their safety. In this manner they spend the winter months in the Southern and Western Countries. There, indeed, they are far more abundant than in our eastern districts, just because the climate is milder, the human population more dispersed, and the damp fields, meadows, and savannahs more abundant.

The migrations of this species are performed more over the land than along the borders of the sea; and it is probable that its principal breeding-places are in the interior of the Fur Countries; as it has been met there by Sir EDWARD PARRY, Sir JAMES ROSS, Dr. RICHARDSON, and other intrepid travellers. Some, however, remain on our great lakes, and I have seen individuals breeding on the banks of the Wabash, in Illinois, where I found a female and young, all of which I obtained. It was not far above Vincennes, in the month of July. On Lakes Erie and Michigan, nests containing eggs have also been found; but these may have been cases in which the birds were unable to proceed farther north, on account of wounds or other circumstances, or because of the early period at which they might have paired

before the general departure of the flocks, a cause of detention more common in migratory birds than people seem to be aware of. These opportunities, few as they were, have enabled me to see the kinds of places in which the nests were found, the structure of the nest, the number, size, and colour of the eggs; so that I have in so far been qualified to draw a comparison between our Green-winged Teal and that of Europe.

The Green-wings leave the neighbourhood of New Orleans in the end of February; but in the Carolinas they remain until late in March, at which time also they depart from all the places between the Atlantic and the States of Kentucky, Indiana, &c. Farther eastward I have seen this species as late as the 9th of May, when I shot a few not far from Philadelphia. As you advance farther along our coast, you find it more rare; and scarcely any are met with near the shores of the British provinces. In Newfoundland and Labrador, it is never seen. Its migrations southward, I am satisfied, extend beyond the United States; but their extreme limits are unknown to me. I have seldom seen it associate with other species, although I have frequently observed individuals on a pond or river not far from other Ducks. It is more shy than the Blue-winged Teal, but less so than most of our other fresh-water Ducks. Its voice is seldom heard during winter, except when a flock is passing over another that has alighted, when a few of the males call to the voyagers, as if to invite them to join them. Before they depart, however, they become noisy. Combats take place among the males; the females are seen coquetting around them, and most of the birds are paired before they leave us.

In the few instances in which I found the nest of this bird, and they were only three, it was not placed nearer the water than five or six yards, and I should not have discovered it had I not first seen the birds swimming or washing themselves near the spot. By watching them carefully I discovered their landing places, and on going up found a path formed, in a direct line among the rushes. In two cases I came so near the nest, as almost to touch the sitting bird as it rose affrighted. While it flew round me, and then alighted on the water, I viewed the nest, with perhaps more interest than I have felt on most occasions of a like nature. On a scanty bed of the bird's own down and feathers, supported by another of grasses, intermixed with mud and stalks of the plants around, raised to the height of four or five inches, I found seven eggs in one, nine in another, and only five in a third. They were all found in the month of July, and not far from Green Bay. The average measurement of the eggs was an inch and three quarters by an inch and three-eighths. They were much rounded, of a dull yellowish colour, indistinctly marked with a deeper tint, as if soiled. In one of the nests only the eggs were fresh. I took two of them, which I afterwards

ate. Having planted a stick as a mark of recognition, I visited the nest three days in succession, but found that the bird had abandoned it; while those of the other two nests, which were not more than about a hundred yards distant, and whose eggs I had handled quite as much, although I took none away, continued to sit. No male birds were to be seen during my stay in that neighbourhood. I concluded that although the eggs may be touched or even handled and lifted from the nest, yet if they were all replaced, the bird did not take umbrage; but that should any of them be missed, some strong feeling urged her to abandon the rest. Again I thought that as incubation had just commenced with this bird, she cared less about her eggs than the other two whose eggs contained chicks.

Having met with the young of this species only once, at a time when I was less aware of the necessity of noting observations in writing, I am unwilling to speak of their colours from recollection. All I can say is that I had great trouble in catching four of them, so cunningly did they hide in the grass, and so expert were they at diving.

Green-winged Teal, *Anas Crecca*, Wils. Amer. Orn., vol. viii. p. 101.
Anas Crecca, Bonap. Syn., p. 386.
American Teal, *Anas Crecca*, var. Nutt. Man., vol. ii. p. 400.
Anas Crecca, *Green-winged Teal*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 400.
Green-winged Teal, *Anas Crecca*, Aud. Orn. Biog., vol. iii. p. 219; vol. v. p. 616.

Male, 14¾, 24. Female, 13¾, 22½.

Dispersed throughout the country during autumn and spring. Extremely abundant during winter in all the Southern States and Texas. Breeds sparingly along the Great Lakes, and far north.

Adult Male.

Bill almost as long as the head, deeper than broad at the base, depressed towards the end, its breadth nearly equal in its whole length, being however a little enlarged towards the rounded tip. Upper mandible with the dorsal line at first sloping, then concave, towards the ends nearly straight, the ridge broad and flat at the base, then broadly convex, the sides convex, the edges soft, with about fifty-five lamellæ. Nostrils sub-basal, near the ridge, rather small, elliptical, pervious. Lower mandible flattish, with the angle very long and rather narrow, the dorsal line very short, straight, the sides perpendicular with about 130 lamellæ.

Head of moderate size, compressed. Neck of moderate length, rather slender. Body full, depressed. Wings rather small. Feet short, placed rather far back; tarsus short, compressed, at its lower part anteriorly with two series of scutella, the rest covered with reticulated angular scales. Toes scutellate above; first toe very small, free, with a narrow membrane beneath;

third longest; fourth a little shorter; the anterior toes united by reticulated webs, of which the outer is deeply sinuate; claws small, curved, compressed, acute, the hind one smaller and more curved, that of the third toe largest, and with an inner sharp edge.

Plumage dense, soft, blended. Feathers of the middle of the head and upper part of hind neck, very narrow, elongated with soft filamentous disunited bands, of the rest of the head and upper part of neck very short, of the back and lower parts in general broad and rounded. Wings of moderate length, narrow, acute; primaries strong, curved, tapering, second longest, first scarcely shorter; secondaries broad, rather pointed, the inner elongated and tapering, as are the scapulars. Tail short, rounded, and acuminate, of sixteen acuminate feathers.

Bill black. Iris brown. Feet light bluish-grey. Head and upper part of the neck chestnut-brown; a broad band, narrowing backwards, from the eye down the back of the neck, deep shining green, edged with black below, under which is a white line, which before the eye meets another that curves forward and downward to the angle of the mouth; chin brownish-black, as are the feathers at the base of the upper mandible. Upper parts and flanks beautifully undulated, with narrow brownish-black and white bars; anterior to the wings is a short, broad, transverse band of white. Wings brownish-grey; the speculum in its lower half velvet-black, the upper bright green, changing to purple, and edged above with black, behind margined with white, before with reddish-white. Tail brownish-grey, the feathers margined with paler; the upper coverts brownish-black, edged with light yellowish-grey. Lower part of neck anteriorly barred as behind; breast yellowish-white, spotted with black, its lower part white; abdomen white, faintly barred with grey; a patch of black under the tail, the lateral tail-coverts cream-coloured, the larger black, with broad white margins and tips.

Length to end of tail 14¾ inches, to end of claws 15¼; extent of wings 24; wing from flexure 7½; tail 3½; bill along the back $1\frac{7}{12}$, along the edge of lower mandible $1\frac{9}{12}$; tarsus $1\frac{3}{12}$; middle toe $1\frac{6}{12}$, its claw $\frac{5}{12}$. Weight 10 oz.

Adult Female.

The female wants the elongated crest, and differs greatly in colouring. The head and neck are streaked with dark brown and light red, the fore neck whitish; the upper parts mottled with dark brown, the anterior feathers barred, the posterior margined with yellowish-white. The wings are nearly as in the male, but the green of the speculum is less extensive; the lower part of the fore neck is tinged with yellowish-red, and mottled with dark brown, as are the sides; the rest of the lower parts white.

Length to end of tail 13¾; to end of claws 1¼; extent of wings 22½. Weight 10 oz.

Blue-winged Teal

Drawn from Nature by J.J. Audubon FRSFLS.

1. Male 2. Female.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

Male. Width of mouth 5 twelfths; upper mandible very deeply concave, with a median prominent line, which is papillate for half its length; the lamellæ of the upper mandible 55, projecting a little beyond the margin, of the lower about 180, and extremely inconspicuous. Tongue 1¼ inches long, fleshy, deeply grooved above, with thin lamellate margins, the tip semicircular, thin, and horny. Œsophagus 6½ twelfths long, its width 4 twelfths at the lower part of the neck enlarged to 7 twelfths, then contracting to 3 twelfths; the proventriculus oblong, 5 twelfths in breadth. Stomach a transversely elliptical, oblique gizzard, 1 inch 1 twelfth long, 1 inch 3 twelfths broad, its lateral muscles extremely developed, the right 6 twelfths, the left 5 twelfths in thickness, the inferior muscle narrow and prominent, as in all birds of this family; epithelium very dense, with two opposite concave grinding surfaces. Intestine 3 feet 7½ inches, with 16 folds, its general width only 1½ twelfths, enlarging here and there to 2 twelfths; cœca 4½ inches long, for 1½ inches 1 twelfth in breadth, enlarging to 3 twelfths, and toward the extremity 2 twelfths. Rectum 2¼ twelfths long, its width 2½ twelfths. Right lobe of the liver 1 inch 5 twelfths, the other 1 inch 2 twelfths.

Trachea 5 inches long, from 2½ twelfths to 2 twelfths in width, moderately flattened, ending in a transversely elongated tympanum, projecting to the left side, with a roundish thin bony prominence; its greatest breadth 8 twelfths, its length 3 twelfths; the rings rather broad, firm, 115, besides a few blended with the tympanum. The muscles as usual. Bronchial half rings 28 and 34.

BLUE-WINGED TEAL.

ANAS DISCORS, *Linn.*

PLATE CCCXCIII.—MALE AND FEMALE.

Is it not strange, reader, that birds which are known to be abundant on the Saskatchewan river during the breeding season, and which have been observed as far north as the 57th parallel, should also be found breeding at nearly the same period in Texas? Stranger still it is that species should proceed from certain points, or winter quarters, to both of the above-men-

tioned regions, without paying any regard to the intermediate districts, which yet seem to be as well adapted for breeding in, as they afford thousands of convenient and secluded localities for that purpose. Yet these facts, and many others connected with Nature's wonderful arrangements, we may look upon as intended to increase the innate desire which every true lover of Nature has to study her beautiful and marvellous works.

Having for some years observed such habits exhibited by the Blue-winged Teal and other birds, I have been induced to believe in the existence of what I would term *a double sense of migration* in many species, acted upon both in spring and in autumn, and giving to them at the latter period, the power as well as the desire of removing from the higher latitudes to opposite or meridional parts, thus to enter into the formation of the Fauna of different countries, from which again they are instigated to return to the place of their nativity, and thence diverge toward new sections of the globe equally adapted to their wants. If these observations should prove not unfounded, we need no longer be surprised to meet in different portions of the world with species which hitherto were supposed to be inhabitants only of far distant shores.

The mouths of the Mississippi, surrounded by extensive flat marshes, which are muddy, and in some degree periodically inundated by the overflowings of that great stream, or by the tides of the Mexican Gulf, and having in the winter months a mildness of temperature favourable to almost all our species of Waders and Swimmers, may be looked upon as the great rendezvous of the Blue-winged Teals, which are seen arriving there coastways, in autumn and the greater part of winter, to meet the multitudes that have travelled across the interior from the north and west. At New Orleans, and during spring, when this bird is in full plumage, it is called by the Creoles of Louisiana "Sarcelle Printanniere;" and in autumn, when scarcely an individual can be seen retaining the beauty of its spring plumage, it is known as the "Sarcelle Automniere;" in consequence of which double appellation, many persons imagine that there are two Blue-winged Teals.

They are the first Ducks that arrive in that part of the country, frequently making their appearance in the beginning of September, in large flocks, when they are exceedingly fat. They depart, however, when the cold becomes so intense as to form ice; and in this respect they differ from the Green-winged Teals, which brave the coldest weather of that country. Toward the end of February, however, they are as abundant as ever, but they are then poor, although their plumage is perfected, and the males are very beautiful. During their stay, they are seen on bayous and ponds, along the banks of the Mississippi, and on the large and muddy sand-bars around, feeding on grasses and their seeds, particularly in autumn, when they are

very fond of the wild pimento. Many remain as late as the 15th of May, in company with the Shoveller and Gadwall Ducks, with which they are usually fond of associating.

On my reaching the south-western pass of the Mississippi, on the 1st of April, 1837, I found these birds very abundant there, in full plumage, and in flocks of various sizes. On the 11th of the same month, when about a hundred miles to the westward, we saw large and dense flocks flying in the same direction. On the 15th, at Derniere Isle, the Blue-wings were very plentiful and gentle. Two days after, they were quite as numerous round Rabbit Island, in the bay called Cote Blanche; and on the 26th they were found on all the ponds and salt bayous or inlets of Galveston Island in Texas, as well as on the water-courses of the interior, where I was assured that they bred in great numbers. Though on account of the nature of the localities in which these Teals breed, and which cannot be explored otherwise than in extremely light canoes, or by risking being engulfed in oozy morasses covered with tall grass, we were not so fortunate as to find any of their nests, we could easily judge by their manœuvres both while on wing and on the water, that we were not far from their well-concealed treasures, and the females which we procured unequivocally exhibited the state of exhaustion common in the course of incubation.

During the months of September and October, this species is plentiful on the Ohio, and in the whole of the Western Country, through which they pass again in April, but without tarrying. On the other hand, they seem to prolong their stay at this season in our Eastern Districts more than in autumn; and this is also the case in South Carolina, as I learn from the observations of my friend JOHN BACHMAN, who has seen them mated there as early as February. I have found them in the Boston markets on the 8th of September, but it is very rare to see any of them there in full spring dress. I saw or heard of none when I was in Labrador and Newfoundland; from which it may be inferred that those found in the Fur Countries reach them through the interior. They also occur on the Columbia river. On the 21st of March, 1821, I saw many Blue-winged Teals copulating on the Mississippi, a little below Natchez; yet none of these birds have been known to breed in that section of the country. They were at the time mentioned on a sand-bar in company with some American Widgeons, which also were similarly employed.

The flight of the Blue-winged Teal is extremely rapid and well sustained. Indeed, I have thought that, when travelling, it passes through the air with a speed equal to that of the Passenger Pigeon. When flying in flocks in clear sunny weather, the blue of their wings glistens like polished steel, so as to give them the most lively appearance; and while they are wheeling

over the places in which they intend to alight, their wings being alternately thrown in the shade and exposed to the bright light, the glowing and varied lustre thus produced, at whatever distance they may be, draws your eyes involuntarily towards them. When advancing against a stiff breeze, they alternately show their upper and lower surfaces, and you are struck by the vivid steel-blue of their mantle, which resembles the dancing light of a piece of glass suddenly reflected on a distant object. During their flight, they almost constantly emit their soft lisping note, which they also utter when alighted and under apprehension of danger. I have never observed them travelling in company with other Ducks, but have seen them at times passing over the sea at a considerable distance from land. Before alighting, and almost under any circumstances, and in any locality, these Teals pass and repass several times over the place, as if to assure themselves of the absence of danger, or, should there be cause of apprehension, to watch until it is over. They swim buoyantly, and generally in a close body, at times nearly touching each other. Indeed, during their first appearance in autumn, when you are apt to meet with a flock entirely composed of young birds, you may, by using a little care, kill a considerable number at one shot. I was assured by a gunner residing at New Orleans, that as many as one hundred and twenty had been killed by himself at a single discharge; and I myself saw a friend of mine kill eighty-four by pulling together the triggers of his double-barrelled gun!

The Blue-winged Teal is easily kept in captivity, and soon becomes very docile. In this state it feeds freely on coarse corn meal, and I have no doubt that it could readily be domesticated, in which case, so tender and savoury is its flesh, that it would quickly put the merits of the widely celebrated Canvass-backed Duck in the shade.

In the course of my stay in East Florida, at General HERNANDEZ'S, and Mr. BULOW'S, I have observed this Teal in company with the Red-breasted Snipe, the Tell-tale Godwit, and the Yellow-shank Snipe. I observed the same circumstance in Texas.

During the time of their residence on the Delaware river, they feed principally on the seeds of the wild oats, which I also found them to do whilst at Green Bay. I have been assured by persons residing on the island of Cuba, that the Blue-winged Teal is abundant, and breeds there.

The old males lose the spring plumage of the head almost entirely during a great portion of the autumn and winter, but it is reassumed sometimes as early as the beginning of January. The young of both sexes in their first plumage resemble the females, but the males acquire their full beauty before they are a year old.

Blue-winged Teal, *Anas discors*, Wils. Amer. Orn., vol. viii. p. 74.
Anas discors, Bonap. Syn., p. 385.
Anas discors, *Blue-winged Teal*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 444.
Blue-winged Teal, Nutt. Man., vol. ii. p. 397.
Blue-winged Teal, *Anas discors*, Aud. Orn. Biog., vol. iv. p. 111.

Male, 16, 31¼. Female, 15, 24.

Breeds in Texas and westward. Great Lakes. Fur Countries. Columbia river. Very abundant in autumn and spring in the Middle Atlantic Districts, as well as in the interior. Abundant also in all the Southern States.

Adult Male.

Bill almost as long as the head, deeper than broad at the base, depressed towards the end, its breadth nearly equal in its whole length, being however a little enlarged towards the rounded tip. Upper mandible with the dorsal line at first sloping, then nearly straight, on the unguis decurved, the ridge broad and flat at the base, suddenly narrowed over the nostrils, broader and convex towards the end; the sides erect at the base, afterwards sloping and convex; the narrow membranous margins a little broader towards the end. Nostrils sub-basal, near the ridge, rather small, elliptical, pervious. Lower mandible flattened, straight, with the angle very long and rather narrow, the dorsal line very short, and slightly convex, the sides internally erect, with about a hundred and twenty lamellæ.

Head of moderate size, oblong, compressed. Neck of moderate length, rather slender. Body full, depressed. Feet short, placed rather far back; tarsus short, compressed, at its lower part anteriorly with two series of scutella, the rest covered with reticulated angular scales. Toes with numerous scutella above; first toe very small and with a narrow membrane beneath; third longest, fourth about a quarter of an inch shorter; the anterior toes united by reticulated webs, of which the outer is deeply sinuated; claws small, curved, compressed, acute, the hind one smaller and more curved, that of the third toe largest, and with the inner margin sharp.

Plumage dense, soft, and blended. Feathers of the head and neck very small and slender, of the back and lower parts in general broad and rounded. Wings of moderate length, rather narrow and acute; primaries strong, slightly curved, tapering, the first scarcely longer than the second, the rest rapidly decreasing; secondaries broad, the outer obliquely rounded, the inner elongated and acuminate, as are the scapulars. Tail short, rounded and acuminate, of fourteen rather narrow, acuminate feathers.

Bill bluish-black. Iris dark hazel. Feet dull yellow, webs dusky, claws brownish-black, with the tips greyish-yellow. Upper part of the head black; a semilunar patch of pure white on the side of the head before the eye, margined before and behind with black. The rest of the head, and the anterior

parts of the neck, of a deep purplish-blue, with purplish-red reflections; the lower hind neck and fore part of back, brownish-black, glossed with green, each feather with a curved band of pale reddish-buff, and a line or band of the same in the centre; the hind part of the back greenish-brown, the feathers edged with paler. The smaller wing-coverts of a rich ultramarine blue, silky, with almost metallic lustre. Alula, primary coverts, and primary quills, greyish-brown, edged with pale bluish; outer secondaries of the same colour, those of the speculum duck-green, changing to blue and bronze, with a narrow line of white along their terminal margin; the inner greenish-black on the outer web, greenish-brown on the inner, with a central and narrow external margin of pale reddish-buff, the more elongated scapulars similar, but some of them margined with greenish-blue. Secondary coverts brown, with their terminal portion white. Tail-feathers chocolate-brown, slightly glossed with green, their margins buffy. The lower parts are pale reddish-orange, shaded on the breast with purplish-red, and thickly spotted with black, the number of roundish or elliptical spots on each feather varying from ten to twenty-five, those on the upper and hind parts of the sides running into transverse bars. Axillar feathers, some of the lower wing-coverts, and a patch on the side of the rump pure white; lower tail-coverts brownish-black.

Length to end of tail 16 inches, to end of claws 14¼, to end of wings also 14¼; extent of wings 31¼; wing from flexure $7\frac{4}{12}$; tail $3\frac{5}{12}$; bill along the back 1¼, from frontal process to tip 1½; tarsus $1\frac{3}{12}$; first toe and claw $\frac{5}{12}$; middle toe and claw $1\frac{0}{12}$; outer toe and claw $1\frac{3}{12}$. Weight 12½ oz.

Adult Female.

Bill greenish-dusky; iris hazel; feet of a duller yellow than those of the male; the head and neck are pale dull buff, longitudinally marked with brownish-black lines, which are broader and darker on the top of the head; the fore part of the cheeks and the throat whitish, without markings. The upper parts are dark brown, the feathers margined with brownish-white; the smaller wing-coverts coloured as in the male, but less brilliantly; no blue on the scapulars, which are also less elongated. On the lower parts, the feathers are dusky-brown, broadly margined with light brownish-grey, of which there is a streak or spot in the centre. The axillary feathers, and some of the lower wing-coverts are white, but the patch of that colour so conspicuous in the male is wanting.

Length to end of tail 15 inches, to end of wings 14½, to end of claws 15½; extent of wings 24; wing from flexure 7¼; tail $2\frac{7}{12}$; bill along the ridge $2\frac{3}{12}$. Weight 10½ oz.

The young birds are similar to the female, but paler, and without the green speculum.

Shoveller Duck

Drawn from Nature by J.J. Audubon FRSFLS

Male 2 Female

Lith.ª Printed & Col.ª by J. T. Bowen Philad.ª

In a male, the roof of the mouth is deeply concave, with a prominent middle ridge, on which are a few blunt papillæ; on the upper mandible are 50 lamellæ, on the lower about 65 below, and 85 above. The tongue, 8 twelfths long, large and fleshy, has two rows of lateral bristles. The œsophagus is 8½ inches long, 4 twelfths in diameter until the middle of the neck, when it enlarges gradually to half an inch. The proventriculus is 1¼ inches in length with oblong glandules. The stomach is a strong roundish gizzard, 1 inch and 2 twelfths long, 1½ inches broad; its left muscle 7 twelfths thick, the right 6½ twelfths; its cuticular lining or epithelium of moderate thickness and longitudinally rugous. The intestine, 5 feet 1 inch long, varies in diameter from 3 to 2 twelfths; the cœca are 2 inches 10 twelfths long, cylindrical and rounded, their diameter 3 twelfths; the cloaca globular. The contents of the stomach were gravel and seeds of plants.

The trachea is 6 inches and 2 twelfths long; its diameter at the top 4 twelfths, at the middle 2 twelfths, at the lower part 3½ twelfths. The inferior larynx is formed of three or four united rings, and has an irregular roundish bony expansion on the left side. The number of rings of the trachea is 98, of the bronchi about 25. The contractor muscles are large; cleido-tracheales and sterno-tracheales.

SHOVELLER DUCK.—MICOINE.

ANAS CLYPEATA, *Linn.*

PLATE CCCXCIV.—MALE AND FEMALE.

The Creoles of Louisiana are well acquainted with this species, under the name of "*Micoine*," the etymology of which I am unable to trace. In that country it arrives, both from the westward and from the eastern inland districts, along with the Blue-winged Teal, or at the commencement of autumn. It associates with that species, to which, as well as to the Green-winged, the Mallard, the Dusky Duck, and the Gadwall, I should consider it very nearly allied, notwithstanding the peculiar expansion of its bill. The Shovellers remain in the lower parts of Louisiana during the whole of the winter, and depart along with the Blue-wings between the end of April and the middle

of May. There, in early spring, they resort chiefly to ponds, where they feed on grasses and their seeds, as well as at times a small kind of onion, the bulbs of which they pull up from the moist grounds on their margins. This may perhaps to some seem strange, but I have long since made up my mind to learn from Nature, and believe what is, rather than what philosophers imagine ought to be. Having fed through the night; they collect towards dawn into large bands, and betake themselves to the margins of sand-bars on the Mississippi, where they spend the greater part of the day. At other times I have found them swimming or wading along the muddy margins of ponds and streams, immersing the head and part of the neck while alternately moving the bill to either side, in the manner of the Roseate Spoonbill, sifting as it were the contents of the soft mud or water, and ejecting the substances unfit for food. Repeated inspection of the stomach has shewn me that the Shoveller is not more nice as to the quality of its food than the Mallard or any other of the Duck tribe, for I have found in it leeches, small fishes, large ground-worms, and snails. They never, however, I believe, feed by semi-immersion, like the Mallards and Teals; nor do they dive unless hard pressed, or when in a sportive mood, when they will dash for a moment beneath the surface.

This species is generally considered scarce in the United States, and I believe it is so, for, although many pass northward and breed in the Fur Countries, a greater number spend the summer months in Texas and the districts farther westward. It is however abundant on the streams of the Rocky Mountains, as well as on the tributaries of the Columbia river, where it was frequently observed by Mr. TOWNSEND, during summer.

We have no Ducks in the United States whose plumage is more changeable than that of the male of this beautiful species. While the female is sitting on her eggs, he undergoes a moult, after which he appears mottled, and seems as if inclined to assume the garb of his partner. From this period, the beginning of July, until late in November, very few finely-coloured males are to be seen, and only such as have not mated that season, in which case they do not moult until the beginning of winter, as if to be the sooner ready to associate with females on the approach of the next breeding season.

In the Carolinas, this species, though found during winter in the rice-fields, is not abundant; more than three or four being seldom seen together. In our Central and Eastern Districts, they are rather rare, and a male in full dress is not to be obtained without difficulty, although I have seen some in the markets of New York and Philadelphia.

The Shoveller walks prettily, and I have often admired its movements in e puddles formed by heavy dashes of rain in our southern corn-fields, here I have found it in company with the Wood Duck, the Mallard, and

the Pin-tail. Its flight resembles that of the Blue-winged Teal; and in tenderness as well as in flavour, it rivals, as an article of food, that beautiful bird. No sportsman who is a judge will ever pass a Shoveller to shoot a Canvass-back. It is rarely however found on salt water, and that only when compelled to resort thither.

In the beginning of May, when I was in Texas, I found Shovellers breeding in considerable numbers. The males had already left the females, and were seen on the sand-bars of the Bay of Galveston, up to the river St. Jacinto, but none of my party discovered the nest. During the autumn, they are to be seen on the waters adjoining the Ohio, and generally in ponds in company with the Bald-pate or American Widgeon, when they become very fat, and afford delicious eating. At this time I have been often much pleased when, on perceiving a flock of eight or nine of these Ducks, probably members of a single family, and cautiously approaching them, while they were busily engaged in searching for food with their heads and necks immersed, I have obtained several of them at the first shot, and as the survivors flew off have succeeded in procuring one or two more. On such occasions, they rise almost perpendicularly to the height of fifteen or twenty feet, and then fly off in a direct course, in the manner of Mallards.

Shoveller, *Anas clypeata*, Wils. Amer. Orn., vol. viii. p. 45.

Anas clypeata, Bonap. Syn., p. 382.

Anas clypeata, *Shoveller*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 439.

Shoveller, Nutt. Man., vol. ii. p. 383.

Shoveller Duck, *Anas clypeata*, Aud. Orn. Biog., vol. iv. p. 241.

Male, 20½, 31½. Female, 17, 29½.

Breeds abundantly in Texas, westward to the Columbia and Fur Countries. During winter from the Middle Atlantic Districts to Texas. Common.

Adult Male.

Bill longer than the head, higher than broad at the base, depressed and much widened towards the end, where its breadth is doubled. Upper mandible with the dorsal line sloping and very slightly concave, the ridge at the base broad, narrowed over the nostrils; sides nearly erect at the base, gradually more declinate and convex; the tip very broadly rounded, with the unguis oblong, rather small, curved and rounded at the extremity; the margins soft, with very numerous lamellæ, which are prolonged beyond the edges and taper to a point, unless at the commencement of the broadest part of the bill. Nasal groove elliptical, and filled by the soft membrane of the bill; nostrils elliptical, pervious, placed near the ridge. Lower mandible slightly curved upwards, with the angle very long and narrow, the unguis obovate.

Head of moderate size, oblong, compressed, rounded above; neck moderate; body rather full, slightly depressed. Feet short, stout, placed a little behind the centre of the body; legs bare a little above the joint; tarsus very short, moderately compressed, anteriorly with small scutella, and an external short series of larger, on the other parts reticulated with small scales. Hind toe very small, with a narrow free membrane; third toe longest, fourth almost as long; the three anterior slender, with numerous oblique scutella, and connected by webs which have the margin concave and denticulate; the inner toe with a broad margin. Claws small, arched, compressed, acute; that of middle toe slightly dilated on the inner edge.

Plumage dense, soft, and elastic; of the head and neck short, blended, and splendent; of the occiput and nape considerably elongated; of the other parts in general broad and rounded. Wings of moderate length, acute; primaries narrow and tapering, the first longest, the second very little shorter; the secondaries broad, curved inwards; the inner elongated and tapering. Tail short, rounded, of fourteen acute feathers, of which the two middle extend five twelfths of an inch beyond the next.

Bill greyish-black, tinged with yellow. Iris reddish-orange. Feet vermilion; claws dusky. Head and upper part of neck deep green, with purplish reflections, the top of the head of a darker tint with less vivid gloss. A longitudinal band on the hind neck and the back, greyish-brown, the feathers edged with paler; the rump and upper tail-coverts greenish-black. The anterior scapulars white, the posterior elongated, light blue on the outer web, longitudinally banded with white and greenish-black on the inner. Smaller wing-coverts light blue; alula, primary coverts, and primary quills, blackish-brown, their shafts white. Outer secondaries greyish-brown, eight of them externally of a rich duck-green; the inner greenish-black, with a longitudinal white streak; the secondary coverts broadly tipped with white. Tail-feathers greyish-brown, irregularly variegated and margined with reddish-white, that colour enlarging on the outer feathers. Lower part of neck pure white; breast and middle part of abdomen dull purplish-chestnut. A large patch of white on each side of the rump, with a band of the same towards the tail; lower tail-coverts greenish-black, with bright green and blue reflections; axillaries and lower wing-coverts pure white.

Length to end of tail 20½ inches, to end of wings 19, to end of claws 21¼; extent of wings 31½; bill along the ridge $2\frac{8}{12}$; wing from flexure $9\frac{8}{12}$; tail $2\frac{9}{12}$; tarsus $1\frac{4}{12}$; first toe and claw $1\frac{8}{12}$; third toe $1\frac{9}{12}$, its claw $\frac{5}{12}$; fourth toe $1\frac{9}{12}$, its claw $3\frac{4}{12}$. Weight 1 lb. 9 oz.

Female.

Bill dull yellowish-green, iris paler than in the male; feet as in the male, but lighter. The upper parts are blackish-brown, the feathers edged with

light reddish-brown; the throat and sides of the head are light reddish-brown, which is the prevailing colour over the lower part of the neck, a portion of the breast and the sides, of which, however, the feathers are margined with dusky; the middle of the breast white. Smaller wing-coverts dull brownish-grey; alula and primaries as in the male; inner secondaries brownish-black; the speculum as in the male, but paler, and changing to blue; the secondary coverts tipped with white; tail nearly as in the male.

Length to end of tail 17 inches; to end of claws 20; bill along the ridge $2\frac{1}{12}$; extent of wings $29\frac{1}{2}$. Weight 1 lb. 1 oz.

The bill of a male measures 2 inches and 8 twelfths along the ridge, the frontal angles 4 twelfths more; the breadth of the upper mandible at the base is $8\frac{1}{2}$ twelfths, near the end 1 inch and 3 twelfths. The roof of the mouth is broadly and deeply concave, with a prominent median ridge, which becomes papillate towards the base; the edges of the mandible soft, direct, inflected towards the end; lamellæ projecting beyond the margins and tapering to a point. On each side of the lower mandible are about 220 lamellæ, and about 180 on the upper. The tongue is $2\frac{2}{4}$ inches long, deeply emarginate at the base, with numerous papillæ, for half an inch narrow and compressed, then for an inch expanded, with a thin longitudinal flap above on each side divided into lamellæ and minute bristles, at its anterior part having a breadth of 1 inch and terminating abruptly, but with a median thin semicircular tip, which is 3 twelfths long.

The œsophagus is 8 inches and 10 twelfths long, $4\frac{1}{2}$ twelfths in diameter, its walls thick. The proventriculus is oblong, 1 inch in length; its glandules of moderate size. The stomach is a strong gizzard of moderate size; the lateral muscles and their tendons large, as in all other Ducks. The intestine is very long, measuring 8 feet, and very narrow, its diameter being from 2 twelfths to $1\frac{1}{2}$ twelfths, for half its length, after which it enlarges to $3\frac{1}{2}$ twelfths at the distance of about 2 feet from the commencement of the rectum, then gradually diminishes to 2 twelfths. The rectum is 3 inches 2 twelfths long, the cœca 4 inches, their diameter for $1\frac{1}{4}$ inches $1\frac{1}{2}$ twelfths, afterwards $3\frac{1}{2}$ twelfths.

The trachea is 6 inches 9 twelfths long, very little flattened, its diameter at the upper part $2\frac{1}{2}$ twelfths, gradually enlarging to 4 twelfths. On the left side of the inferior larynx there is a rounded expansion of very moderate size compared with that observed in many other Ducks. The rings are 98; those at the lower part broader and much stronger, but all of them ossified. The bronchial half rings about 35.

In another individual, the stomach is $1\frac{1}{2}$ inches long, $1\frac{5}{12}$ broad; the right lateral muscle 6 twelfths thick. Contents, particles of quartz, and fragments

of shells. Intestine 11 feet 6 inches long; cœca 6¼ inches long; rectum 3½ inches.

Long intestines, like long bills, often exhibit great differences in the same species; for which reason characters taken from the length of these parts must be received with latitude. Even in the Rapacious Birds, in which the intestine is generally very short, considerable differences are observed in individuals of the same sex and size. It will be seen from the above statement that the Shoveller has a longer and more slender intestine than any other American Duck. In this respect it is analogous to Pandion and Haliaetus among the Raptores; generalizing vaguely from the consideration of which, as some have done, one might be apt to conclude that it is more piscivorous than the Canvass-back and Pochard, which, however, is by no means the case. Although in some birds and mammalia a very elongated intestinal canal is connected with piscivorous habits, yet many birds which feed exclusively on fish, such as Gannets, Auks, and Guillemots, have the intestine of only moderate length or short. It appears simply that when for some reason resulting from the economy of the species, the intestine must be elongated, it is made proportionally narrow; whereas if it be expedient that it should be short, its calibre is increased.

Genus V.—FULIGULA. SEA-DUCK.

Bill about the length of the head or shorter, higher than broad at the base, depressed toward the end, the margins parallel, slightly dilated towards the end, which is rounded, the frontal angles rather pointed; upper mandible with the dorsal line generally declinate, but various at the base, being often prominent, the ridge broad at the base, narrowed at the middle, enlarged and convex at the end, the sides nearly erect at the base, gradually more declinate, the edges soft and internally lamellate, the unguis oblong and decurved; lower mandible flattened, being but slightly convex, with the angle very long and rather narrow, the dorsal line very short and straight, the edges internally lamellate, the unguis flat, obovato-elliptical. Nostrils sub-medial,

Canvass Back Duck

linear-oblong, rather large, near the ridge, in an oblong depression covered with the soft membrane of the bill. Head rather large, compressed, convex above; neck of moderate length, rather thick; body full, depressed. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with narrow scutella continuous with those of the middle toe, and having another series commencing half-way down and continuous with those of the outer toe; hind toe small, with an inner expanded margin; middle toe nearly double the length of the tarsus, outer a little shorter, all scutellate. Claws small; compressed, that of the first toe very small and curved. Plumage dense, firm, blended. Wings shortish, narrow, pointed, first and second quills longest; inner secondaries elongated and tapering. Tail very short, rounded or cuneate, of fourteen or more feathers. Œsophagus rather wide, considerably dilated at the lower part of the neck; stomach an extremely muscular, roundish gizzard; intestine long and wide; cœca long. Trachea of the males with a transverse, bony, unsymmetrical dilatation at the inferior larynx.

CANVASS-BACK DUCK.

FULIGULA VALISNERIANA, *Wils.*

PLATE CCCXCV.—MALE AND FEMALE.

The range of this celebrated Duck may be considered as limited on the one hand by the mouths of the Mississippi, and on the other by the Hudson or North river. Beyond the latter it is rarely seen at any season on our eastern coasts; and this circumstance, conjoined with its being now and then observed on the upper waters of our Western Districts, and its breeding in great numbers on the borders of Bear river, which flows into the salt lake of Timpanajoz in Upper California, as well as in the marshes and along the banks of streams in many parts of the Rocky Mountains, induces me to believe that the individuals of this species, instead of proceeding along the shores, pass overland towards their breeding grounds, however far northward they may be situated. According to Dr. RICHARDSON, it breeds in all parts of the Fur Countries, from the 50th parallel to their most northern limits.

While in our Atlantic Districts, it is found in much greater numbers on the Chesapeake and the streams that flow into it, than anywhere else. Indeed it is not more than twenty years since its regular appearance and sojourn on the waters of the Southern States has been observed or at least acknowledged. Although at New Orleans, where it goes by the name of *Canard Cheval*, it has been known to the oldest duck-shooters now alive, from their earliest recollection, it is not more than about fifteen years since it began to rise from a very low price to two dollars the pair, at which it sold during my visit in March, 1837.

This enhancement of its value I look upon as having arisen from the preference given to it by the epicures of our Middle Districts, who have strangely lauded it as superior to every other Duck in the world. This alleged pre-eminence has indeed become so deeply impressed on the minds of many of our Southerns, that they have on various occasions procured the transportation of numbers of Canvass-backs from Baltimore to Charleston in South Carolina, and even to Savannah in Georgia, although this species is by no means uncommon within a few miles of the latter city, as well as on the Great Santee river. I well remember that on my pointing out to a friend, now alas dead, several dozens of these birds in the market of Savannah, he would scarcely believe that I was not mistaken, and assured me that they were looked upon as being poor, dry, and very fishy, in short not half so good as Mallards, or Blue-winged Teals. With this I cordially agreed, for there, at that season, they are not better than represented.

I found this species in considerable numbers on and about the numerous inlets and rivers of East Florida; but did not see a single individual on the Gulf of St. Lawrence, along the coast of Labrador, or on that of Newfoundland.

It arrives in the neighbourhood of New Orleans from the 20th of October to the end of December, coming in flocks of eight or twelve, probably the members of a single family, and, unlike many other species, keeping in small groups during winter. At the approach of spring, however, they flock together, and about the first of April depart in large bodies. During their stay, they are wont to alight on wet prairies and muddy ponds in all open places, feeding on the seeds of various plants, of which may be particularized the wild oat and the water-lily.

According to ALEXANDER WILSON, who first described this species, their arrival in autumn in the Middle Districts takes place about the 15th of October; but more recent writers say, that "unless the weather to the north has been severe, the Canvass-back rarely appears till the middle of November." With this I fully agree, being convinced that their journeys to and from their breeding places are performed across the country. Were this

perfectly ascertained, it would prove that this species, unlike most other Ducks, instead of removing farther southward in autumn and winter, takes what may be called a lateral march toward our Eastern Districts, in which it remains until the weather has become too cold for its constitution, when it is forced a second time to migrate, and betake itself to warmer parts of the country, where it continues during the rest of the winter.

The flight of this species, although resembling that of our larger Sea-ducks in having the appearance of being rather laboured, is strong, rapid, at times very elevated, and well sustained. It swims deeply, especially when under apprehension of danger, and this probably the better to enable it to escape by diving, at which it is almost as expert as our sea or diving Ducks. But although its speed on the water is considerable, it moves rather heavily on land. Its food varies, according to the season and locality. The plant named *Valisneria*, on which it is said to feed when on the head waters of the Chesapeake, is not found equally abundant in other parts, and even there is at times so reduced in quantity, that this duck and several other species which are equally fond of it, are obliged to have recourse to fishes, tadpoles, water-lizards, leeches, snails, and mollusca, as well as such seeds as they can meet with; all which have been in greater or less quantity found in their stomach.

Nothing is known of its manners during the breeding season; and we are equally ignorant of the changes of plumage which, like other species, it may undergo at that period.

As I have not had very good opportunities of making myself acquainted with the modes in which the Canvass-backs are obtained for the markets, I here present an account of duck-shooting on the waters of the Chesapeake, published some years ago in the "Cabinet of Natural History," and of which a copy has been transmitted to me by its author, Dr. J. J. SHARPLESS, of Philadelphia, to whom, for this and other marks of attention, I offer my best thanks.

"The Chesapeake Bay, with its tributary streams, has, from its discovery, been known as the greatest resort of water-fowl in the United States. This has depended on the profusion of their food, which is accessible on the immense flats or shoals that are found near the mouth of the Susquehanna, along the entire length of North-East and Elk rivers, and on the shores of the bay and connecting streams, as far south as York and James rivers.

"The quantity of fowl of late years has been decidedly less than in times gone by; and I have met with persons who have assured me that the number has decreased one-half in the last fifteen years. This change has arisen, most probably, from the vast increase in their destruction, from the greater number of persons who now make a business or pleasure of this sport, as

well as the constant disturbance they meet with on many of their feeding grounds, which induces them to distribute themselves more widely, and forsake their usual haunts.

"As early as the first and second weeks in October, the smaller Ducks, as the Buffel-head, *Anas Albeola;* South-Southerly, *A. glacialis;* and the Ruddy or Heavy-tailed Duck, *A. rubida*, begin to shew themselves in the upper part of the bay; and by the last of the month, the Black-head, *A. Marila;* Widgeon or Bald-pate, *A. Americana;* Red-head, *A. Ferina;* and the Goose, *A. Canadensis*, appear, and rapidly distribute themselves down the bay. The Canvass-back, *A. Valisneria*, and the Swan, *Cygnus Americanus*, rarely, unless the weather to the north has been severe, appear in quantities till the middle of November. All these fowl, when first arrived, are thin and tasteless, from their privation during their migration, and perhaps preparatory arrangements, and require some days at least of undisturbed repose to give them that peculiar flavor for which some of them are so celebrated. During the low tides succeeding their arrival, the birds sit on the flats far from the shores, and rarely rise to the wing unless disturbed; but when the spring-tides render the water too deep for feeding, they commence their career, and pass down the bay in the morning, and return in the evening. Most of these fowl feed on the same grass, which grows abundantly on the shallows in the bay and adjacent waters, and has been called duck-grass, *Valisneria Americana.* It grows from six to eighteen inches in length, and is readily pulled up by the root. Persons who have closely observed these Ducks while feeding, say that the Canvass-back and Black-head dive and pull the grass from the ground, and feed on the roots, and that the Red-head and Bald-pate then consume the leaves. Indeed, although the Bald-pate is a much smaller bird than the Canvass-back, it has been seen to rob the latter, immediately on its return from under the water, of all its spoil.

"All these larger Ducks are found together when feeding, but separate when on the wing. That they feed on the same grass, is evident from the similarity of flavour; and those most accustomed to the article have a difficulty in deciding on the kind of Duck from the taste. Indeed, the Bald-pate is generally preferred by residents.

"By the middle of December, particularly if the weather has been a little severe, the fowl of every kind have become so fat, that I have seen Canvass-backs burst open in the breast in falling on the water; and spending less time in feeding, they pass up and down the bay from river to river, in their morning and evening flights, giving, at certain localities, great opportunities for destruction. They pursue, even in their short passages, very much the order of their migratory movements, flying in a line, or baseless triangle;

and when the wind blows on the *points*, which may lie on their course, the sportsman has great chances of success. These points or courses of the Ducks are materially affected by the winds, for they avoid, if possible, an approach to the shore; but when a strong breeze sets them on these projections of the land, they are compelled to pass within shot, and often over the land itself.

"In the Susquehanna and Elk rivers, there are few of these points for shooting, and there success depends on approaching them while on their feeding grounds. After leaving the eastern point at the mouth of the Susquehanna and Turkey Point, the western side of the Elk river, which are both moderately good for flying shooting, the first place of much celebrity is the *Narrows*, between Spesutic Island and the western shore. These narrows are about three miles in length, and from three to five hundred yards in breadth. By the middle of November, the Canvass-backs, in particular, begin to feed in this passage, and the entrance and outlet, as well as many intermediate spots, become very successful stations. A few miles further down the western shore is Taylor's Island, which is situated at the mouth of the Rumney, and Abbey Island at the mouth of Bush river, which are both celebrated for Ducks, as well as Swans and Geese. These are the most northerly points where large fowl are met with, and projecting out between deep coves, where immense numbers of these birds feed, they possess great advantages. The south point of Bush river, or Legoe's Point, and Robbin's and Rickett's Points near Gunpowder river, are fruitful localities. Immediately at the mouth of this river is situated Carroll's Island, which has long been known as a great shooting ground, and is in the rentage of a company at a high rate. Maxwell's Point, as well as some others up this and other rivers and even further down the bay are good places, but less celebrated than those I have mentioned. Most of these points are let out as shooting grounds to companies and individuals, and they are esteemed so valuable that intruders are severely treated.

"It has been ascertained that disturbing the fowl on the feeding flats is followed in most cases by their forsaking those haunts, and seeking others; hence, in the rivers leading to the bay near flying points, they are never annoyed by boat-shooting, either by night or day, and although the discharge of guns from the shore may arouse them for a time, they soon return; whereas a boat or sail in chase a few times, will make them forsake a favourite spot for days.

"From the great number of Ducks that are seen in all directions, one would suppose that there could be no doubt of success at any one of the points in the course of flight; but whilst they have such correct vision as to distance, and wide range of space, unless attending circumstances are favour-

able, a sportsman may be days without a promising shot. From the western side of the bay, and it is there the best grounds are found, the southerly winds are the most favourable; and if a high tide is attended by a smart frost and mild south wind, or even calm morning, the number of birds set in motion becomes inconceivable, and they approach the points so closely, that even a moderately good shot can procure from fifty to one hundred Ducks a day. This has often occurred, and I have seen eight fat Canvass-backs killed at one discharge into a flock, from a small gun.

"To a stranger visiting these waters, the innumerable Ducks feeding in beds of thousands, or filling the air with their careering, with the great numbers of beautiful White Swans resting near the shores, like banks of driven snow, might induce him to suppose that the facilities for their destruction were equal to their profusion, and that with so large an object in view, a sportsman could scarcely miss his aim. But, when he considers the great thickness of their covering, the velocity of their flight, the rapidity and duration of their diving, and the great influence that circumstances of wind and weather have on the chances of success, it becomes a matter of wonder how so many are destroyed.

"The usual mode of taking these birds has been, till recently, by shooting them from the points during their flight, or from the land or boats, on their feeding grounds, or by *toling*, as it is strangely termed, an operation by which the Ducks are sometimes induced to approach within a few feet of the shore, from a distance often of several hundred yards. A spot is usually selected where the birds have not been much disturbed, and where they feed at three or four hundred yards from, and can approach to within forty or fifty yards of the shore, as they will never come nearer than they can swim freely. The higher the tides, and the calmer the day, the better, for they feed closer to the shores and see more distinctly. Most persons on these waters have a race of small white or liver-coloured dogs, which they familiarly call the *toler* breed, but which appear to be the ordinary poodle. These dogs are extremely playful, and are taught to run up and down the shore in sight of the Ducks, either by the motion of the hand, or by throwing chips from side to side. They soon become perfectly acquainted with their business, and as they discover the Ducks approaching them, make their jumps less high till they almost crawl on the ground, to prevent the birds discovering what the object of their curiosity may be. This disposition to examine rarities has been taken advantage of by using a red or black handkerchief by day, and a white one by night in toling, or even by gently plashing the water on the shore. The nearest Ducks soon notice the strange appearance, raise their heads, gaze intently for a moment, and then push for the shore, followed by the rest. On many occasions, I have seen thousands

of them swimming in a solid mass direct to the object; and by removing the dog farther into the grass, they have been brought within fifteen feet of the bank. When they have approached to about thirty or forty yards, their curiosity is generally satisfied, and after swimming up and down for a few seconds, they retrograde to their former station. The moment to shoot is while they present their sides, and forty or fifty Ducks have often been killed by a small gun. The Black-heads toll the most readily, then the Red-heads, next the Canvass-backs, and the Bald-pates rarely. This also is the ratio of their approach to the points in flying, although, if the Canvass-back has determined on his direction, few circumstances will change his course. The total absence of cover or precaution against exposure to sight, or even a large fire, will not turn these birds aside on such occasions. In flying-shooting, the Bald-pates are a great nuisance, for they are so shy that they not only avoid the points themselves, but by their whistling and confusion of flight at such times, alarm others.

"Simple as it may appear to shoot with success into a solid mass of Ducks sitting on the water at forty or fifty yards distance, yet when you recollect that you are placed nearly level with the surface, the object opposed to you, even though composed of hundreds of individuals, may be in appearance but a few feet in width. To give, therefore, the best promise of success, old duckers recommend that the *nearest* Duck should be in perfect relief above the sight, whatever the size of the column, to avoid the common result of over-shooting. The correctness of this principle I saw illustrated in an instance in which I had told to within a space of from forty to seventy yards of the shore, a bed of certainly hundreds of Ducks. Twenty yards beyond the outside birds of the dense mass, were five Black-heads, one of which was alone killed out of the whole number, by a deliberate aim into the *middle* of the large flock from a rest, by a heavy well-proved duck-gun.

"Before I leave the subject of *sitting-shooting*, I will mention an occurrence that took place in Bush river, a few years since. A man whose house was situated near the bank, on rising early one morning, observed that the river had frozen, except an open space of ten or twelve feet in diameter, about eighty yards from the shore, nearly opposite his house. The spot was full of Ducks, and with a heavy gun he fired into it. Many were killed, and those that flew soon returned, and were again and again shot at, till fearful that he was injuring those already his own, he ceased the massacre, and brought on shore ninety-two Ducks, most of which were Canvass-backs.

"To prevent the dogs, whilst toling, from running in, they are not allowed to go into the water to bring out the Ducks, but another breed of large dogs of the Newfoundland and water-spaniel mixture are employed. These animals, whilst toling is in progression, or at a point, take apparently as much

interest in success as the sportsman himself. During a flight, their eyes are incessantly occupied in watching the direction from whence the birds come; and I have frequently seen them indicate by their manner, the approach of a flock so distant that the human eye would have overlooked it. As the Ducks come on, the dog lies down, but still closely observing them, and the moment the discharge occurs, jumps up to see the effect. If a Duck falls dead, they plunge to bring it; but many of them wait to see *how* he falls, and whether he swims, and they seem to be as aware as the gunner, of the improbability of capture, and will not make the attempt, knowing from experience that a bird merely winged will generally save himself by swimming and diving. These dogs usually bring one Duck at a time out of the water; but a real Newfoundland, who was with me and my company this autumn, was seen on several occasions to swim twenty yards further, and take a second in the mouth to carry on shore. The indefatigability and ambition of these animals are remarkable, and a gentleman informed me he had known his dog bring, in the space of one hour, twenty Canvass-backs and three Swans from the water, when the weather was so severe that the animal was covered with icicles, and to prevent his freezing he took his great-coat to envelope him. Some dogs will dive a considerable distance after a Duck, but a crippled Canvass-back or Black-head, will swim so far under water, that they can rarely be caught by the dog; and it often has been observed, that the moment one of these Ducks if merely winged reaches the surface, he passes under, and however calm, cannot be seen again. To give an idea of the extreme rapidity with which a Duck can dive, I will relate an occurrence which was noticed by myself, and a similar one was observed by another of the party the same day. A male South-southerly was shot at in the water by a percussion-gun, and after escaping the shot by diving, commenced his flight. When about forty yards from the boat, he had acquired an elevation of a foot or more from the surface. A second percussion-gun was discharged, and he dived from the wing at the flash, and though the spot of entrance was covered by the shot, soon rose unharmed and flew.

"Canvass-backs, when wounded on the streams near the bay, instantly direct their course for it, and there nestle among the grass on the shores till cured or destroyed by Eagles, Hawks, Gulls, Foxes, or other vermin, that are constantly on the search. If a dead Canvass-back be not soon secured, it becomes a prey to the Gulls, which rarely touch any other kind. I have seen severe contests take place between crippled Canvass-backs and Gulls; and although a pounce or two generally prevents further resistance, sometimes they are driven off. If the bird is remarkably savoury, the Gull makes such a noise, that others are soon collected, when possession is determined by courage or strength.

"Another method of taking Ducks consists in placing gilling-nets under water on the feeding-grounds, and when they dive for food, their head and wings become entangled in the meshes, and they are drowned. This plan, though successful at first, soon drives the bird from these places; and in some cases, a few applications have entirely prevented their return for some weeks. Paddling upon them in the night or day produces the same effect, and although practised to some extent on Bush river is highly disapproved of by persons shooting from points. For the last three years a man has been occupied on this stream with a gun of great size, fixed on a swivel in a boat, and the destruction of game on their feeding-flats has been immense; but so unpopular is the plan, that many schemes have been privately proposed of destroying his boat and gun, and he has been fired at with balls so often that his expeditions are at present confined to the night. Sailing with a stiff breeze upon the Geese and Swans, or throwing rifle-balls from the shore into their beds, is sometimes successful.

"Moonlight shooting has not been a general practice, but as these birds are in motion during light nights, they could readily be brought within range by 'honking' them when flying. This sound is very perfectly imitated at Egg Harbour; and I have seen Geese drawn at a right angle from their course by this note. They can indeed be made to hover over the spot, and if a captive bird was employed, the success would become certain.

"Notwithstanding the apparent facilities that are offered of success, the amusement of duck-shooting is probably one of the most exposing to cold and wet, and those who undertake its enjoyment without a courage 'screwed to the sticking-point,' will soon discover that 'to one good a thousand ills oppose.' It is indeed no parlour sport, for after creeping through mud and mire, often for hundreds of yards, to be at last disappointed, and stand exposed on points to the 'pelting rain or more than freezing cold,' for hours, without even the promise of a shot, would try the patience of even FRANKLIN'S 'glorious nibbler.' It is, however, replete with excitement and charm, and to one who can enter on the pleasure, with a system formed for polar cold, and a spirit to endure 'the weary toil of many a stormy day,' it will yield a harvest of health and delight, that the 'roamer of the woods' can rarely enjoy."

Although this far-famed bird was named by its discoverer after the plant *Valisneria Americana*, on which it partially feeds when on fresh-water, its subsistence is by no means dependent upon that species, which indeed is not extensively distributed, but is chiefly derived from the grass-wrack or Eel-grass, *Zostera marina*, which is very abundant on the shallows and flats along the whole sea-coast. Its flesh seems to me not generally much

superior to that of the Pochard or Red-head, which often mingles in the same flocks; and both species are very frequently promiscuously sold in the markets as Canvass-backs.

In the plate are represented two Males and a Female. In the back ground is a view of Baltimore, which I have had great pleasure in introducing, on account of the hospitality which I have there experienced, and the generosity of its inhabitants, who, on the occasion of a quantity of my plates having been destroyed by the mob during an outburst of political feeling, indemnified me for the loss.

CANVASS-BACKED DUCK, *Anas valisneria*, Wils. Amer. Orn., vol. viii. p. 103.

FULIGULA VALISNERIA, Bonap. Syn., p. 392.

FULIGULA VALISNERIA, *Canvass-backed Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 450.

CANVASS-BACKED DUCK, Nutt. Man., vol. ii. p. 430.

CANVASS-BACKED DUCK, *Fuligula valisneriana*, Aud. Orn. Biog., vol. iv. p. 1.

Male, 22, 33. Female, 20¼, 30¾.

Abundant during winter from the mouth of the Delaware to New Orleans, in all the estuaries. Columbia river. Breeds on the Rocky Mountains and northward.

Adult Male.

Bill as long as the head, deeper than broad at the base, the margins parallel, slightly dilated towards the end, which is rounded, the frontal angles rather narrow and pointed. Upper mandible with the dorsal line at first straight and declinate, then slightly concave, direct for a short space near the tip, where it is incurved, the ridge broad and concave at the base, narrowed at the middle, enlarged and convex at the end, the sides nearly erect and concave at the base, becoming anteriorly more and more declinate and convex, the edges curved upwards, with about 50 lamellæ, the unguis small and oblong. Nostrils sub-medial, linear-oblong, rather large, pervious, near the ridge, in an oblong depression covered with soft membrane. Lower mandible flattened, being but slightly convex, with the angle very long and rather narrow, the dorsal line very short and straight, the erect edges with about 55 inferior and 105 superior lamellæ, the unguis obovato-elliptical.

Head rather large, compressed, convex above. Eyes small. Neck of moderate length, rather thick. Body full, depressed. Wings small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with narrow scutella continuous with those of the middle toe, and having another series commencing half-way down and continuous with those of the outer toe, the rest reticulated with angular scales. Hind toe small, with an inner expanded margin or web; middle toe nearly double the length

of the tarsus, outer a little shorter. Claws small, compressed, that of the first toe very small and curved, of the third toe larger and more expanded than the rest.

Plumage dense, soft, blended. Feathers of the upper part of the head small and rather compact, of the rest of the head and neck small, blended, and glossy. Wings shortish, narrow, pointed; primary quills strong, tapering, the first longest, the second almost as long, the rest rapidly diminishing; secondary quills broad and rounded, the inner elongated and tapering. Tail very short, much rounded, or wedge-shaped, of fourteen feathers.

Bill black, with a tinge of green. Iris bright carmine. Upper part of the head, and a space along the base of the bill, dusky; a small transverse band of white on what is called the chin; the rest of the head, and the neck all round, for more than half its length, of a rich brownish-red. A broad belt of brownish-black occupies the lower part of the neck, and the fore part of the body, of which the posterior part is of the same colour, more extended on the back than under the tail. Back and scapulars white or greyish-white, very minutely traversed by undulating black lines; wing-coverts similar but darker. Alular feathers greyish-brown. Primary quills brownish-black, tinged with grey towards the base; the shaft brown. Secondaries ash-grey, whitish, and undulated with dark grey towards the end; five of them also having a narrow stripe of black along their outer margin. Tail brownish-grey, towards the end ash-grey. The lower parts white, the sides and abdomen marked with fine undulating grey lines, of which there are faint traces on most of the other feathers. The feet are greyish-blue, tinged with yellow.

Length to end of tail 22 inches, to end of wings 20, to end of claws 25; extent of wings 33; wing, from flexure, $9\frac{3}{4}$; tail $2\frac{1}{12}$; bill along the back, measured from the tip of the frontal process to the end of the unguis, 3; lower mandible along the edge $2\frac{7}{12}$; tarsus $1\frac{3}{4}$; first toe $\frac{6}{12}$, its claw $\frac{3}{12}$; middle toe $2\frac{1}{12}$, its claw $\frac{4}{12}$; outer toe scarcely shorter; inner $\frac{7}{12}$ shorter. Weight $3\frac{3}{4}$ lbs.

Adult Female.

The female has the bill coloured as in the male; the iris reddish-brown; the feet lead-grey; the upper parts greyish-brown; the top of the head darker, its anterior part light reddish; the chin whitish; the neck greyish-brown, as are the sides and abdomen; the breast white; wing-coverts brownish-grey; primary quills greyish-brown, dusky at the end; secondary quills ash-grey, five of the inner with an external black margin, the innermost greyish-brown, like the back, and with some of the scapulars faintly undulated with darker. Tail greyish-brown, paler at the end; axillars and smaller under wing-coverts white, as in the male.

Length to end of tail, 20¼ inches, to end of wings 18½, to end of claws, 23½; extent of wings, 30¾; wing from flexure, 9½. Weight 2¾ lbs.

This species is very closely allied to the Pochard, or Red-headed Duck, *Fuligula Ferina*, but is much larger, and differs in having the bill proportionally higher at the base, and less dilated towards the end. The colours are also generally similar, but present differences. The upper parts of the Canvass-back are much whiter than those of the Pochard; the head of the former is dusky above, of the latter uniform with the neck; and the white spot on the chin is wanting in the Pochard.

The Digestive and Respiratory Organs of a male shot near Baltimore present the following characters.

The upper mandible is broadly and deeply concave. The tongue, which is thick and fleshy, as in other Ducks, is $2\frac{3}{12}$ inches long, its sides parallel, slightly sloping, and furnished with two series of bristly filaments; its base with numerous straight conical papillæ directed backwards, its upper surface marked with a broad median groove, the lower flat, its extremity formed by a thin semi-circular appendage, a quarter of an inch in length. The œsophagus passes along the right side of the neck, for six inches has a diameter of $\frac{5}{12}$, then dilates to $\frac{9}{12}$, so as to form a slight crop, again contracts as it enters the thorax, and in terminating forms the proventriculus, which is 1¾ inches in length, with oblong glandules, generally a twelfth of an inch in length. The stomach is a very large and powerful gizzard, of a broadly elliptical form, with extremely thick lateral muscles, the left being $\frac{11}{12}$ in thickness, the right $\frac{13}{12}$, the tendons large and strong. The transverse diameter of the gizzard is $2\frac{11}{12}$ inches, the longitudinal, from the cardiac orifice to the bulge of the inferior muscle, $2\frac{1}{12}$. Its cuticular lining is of very dense texture, and rugous; the grinding plates opposite the lateral muscles about half a twelfth thick, and slightly rugous. The intestine, which is 5 feet 9 inches in length, first forms in the usual manner the duodenal fold, at the distance of 5 inches from the pylorus, encloses the pancreas, receives the biliary ducts, and passing under the right lobe of the liver, proceeds backward beneath the kidneys, is convoluted in several large folds, and finally from above the stomach, passes in a direct course to the anus. Its coats are thick, its inner surface villous, and its diameter is considerable, being in the first part of the duodenum $\frac{9}{12}$, then for two feet from $\frac{5}{12}$ to $\frac{4}{12}$, enlarged again to $\frac{6}{12}$, and so continuing to the rectum, which is 6 inches long, ½ inch in diameter, and ends in an enlargement or cloaca, about an inch in diameter. The cœca, which commence at the distance of 6 inches from the anus, are 8 inches long, slender, $\frac{2}{12}$ in diameter for 3 inches, afterwards about $\frac{3}{12}$, with the extremity obtuse. The œsophagus and stomach contained young shoots of *Zostera marina*, and in the latter were numerous particles of quartz.

Red-headed Duck

1. Male 2. Female

Drawn from Nature by J. J. Audubon F.R.S.F.L.S.

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The trachea, when moderately extended, measures 10 inches in length, and is furnished with strong lateral or contractor muscles, a pair of cleido-tracheal, and a pair of more slender sterno-tracheal. Its diameter at the upper part is 4½ twelfths, it gradually contracts to 3½ twelfths, enlarges to 4½ twelfths, and at the distance of 7¼ inches from the upper extremity, forms a dilatation about an inch in length, and $\frac{7}{12}$ in its greatest diameter, but composed of distinct rings, then contracts to $\frac{3}{12}$, and ends in a bony and membraneous expansion, forming on the left side an irregular thin disk, convex towards the right, and flattened towards the left, where it is membranous. The expansions of the trachea are thus similar to those of the Red-breasted Merganser, but of less extent; the rings are of equal breadth on both sides, but alternately overlap each other, one side being partially concealed by the corresponding sides of those above and below it, while the other stands exposed. The lower larynx is formed of ten united rings, together with the bony and membranous expansion described. The tracheal rings, rather broad and osseous, are 118; the half-rings of the bronchi about 16.

RED-HEADED DUCK.

FULIGULA FERINA, *Linn.*

PLATE CCCXCVI.—MALE AND FEMALE.

At New Orleans, this bird is commonly known by the name of "Dos Gris." It arrives there in great flocks, about the first of November, and departs late in April, or in the beginning of May. On the lakes Borgne, St. John, and Ponchartrain, it is very abundant, keeping in large flocks, separate from the other species. In that part of the country its food consists of small fishes, in pursuit of which it is seen constantly diving. It is caught in different sorts of nets, and easily kept in confinement, feeding greedily on Indian corn, whether entire or crushed by the millstone. In 1816, many thousands of these Ducks, as well as others of different species, were caught in nets by a Frenchman, who usually sent them alive to market in cages from the narrows of the Lakes, especially from those called "La

pointe aux herbes," and the "Isle aux pins." So many of them, however, were procured by this man, that he after awhile gave up sending them alive on account of the great difficulty he encountered in procuring a sufficient number of cages for their accommodation.

Although Dr. RICHARDSON informs us that this species breeds "in all parts of the Fur Countries, from the fiftieth parallel to their most northern limits," I saw none of these birds during the spring and summer months which I spent on the coast of Labrador. I was equally unsuccessful in my search for it in Newfoundland. Indeed, I have never observed it eastward of the State of Massachusetts, although from thence it is more and more abundant the farther south you proceed, until you reach the tributaries of the Mississippi. Beyond the mouths of that river, these birds are rarely seen; and when I was there in April, 1837, none were observed by my party or myself after we had left the South-west Pass on our way westward. In Texas none were even heard of. From these circumstances I have inferred that, along with several other species, the Red-headed Duck reaches the Middle and Southern States by passing overland or following our great streams, such as the Ohio, Missouri, and Mississippi, westward, and the North river, and others eastward, both in its vernal and autumnal migrations. This I am the more inclined to believe, on account of the great numbers which on such occasions I have seen in ponds in the States of Illinois, Indiana, Ohio, and Kentucky.

I found it abundant in the marshes near St. Augustine, in East Florida, on the 8th of November, 1831, when the young males of that year had the breast and lower neck mottled with brown and blackish feathers; and yet whilst at General HERNANDEZ's, in that district, on the 20th of December, they were in almost perfect plumage. At this latter period they were shy, and kept in company with Mallards, American Widgeons, Scaup Ducks, and Spoonbills, generally in shallow fresh-water ponds, at some distance from the sea-shore. In South Carolina, these Ducks are now much more abundant than they were twenty years ago, especially on the Santee river, where my friend Dr. SAMUEL WILSON has shot many of them, as well as of the Canvass-back species.

The Red-headed Duck may be said to be equally fond of salt and fresh water, and is found in abundance, during its stay with us, on the Chesapeake Bay, especially in the month of March, when it associates with the Canvass-back and other Ducks, and is offered for sale in the Baltimore markets in great numbers. There I have seen them sold at 75 cents the pair, which was lower by 25 cents than their price at New Orleans in April, 1837.

Although they dive much and to a great depth, while in our bays and estuaries, yet when in the shallow ponds of the interior, they are seen

dabbling the mud along the shores, much in the manner of the Mallard; and on occasionally shooting them there, I have found their stomach crammed with young tadpoles and small water-lizards, as well as blades of the grasses growing around the banks. Nay, on several occasions, I have found pretty large acorns and beech-nuts in their throats, as well as snails, entire or broken, and fragments of the shells of various small unios, together with much gravel.

In confinement, they do not exhibit that degree of awkwardness attributed to them when on land. It is true that the habitual shortening of the neck detracts from their beauty, so that in this state they cannot be said to present a graceful appearance; yet their aspect has always been pleasing to my sight. Their notes are rough and coarse, and bear less resemblance to the cries of those species which are peculiar to fresh water than those of any other of their tribe. Their flight is performed in a hurried manner, and they start from the water pell-mell; yet they can continue very long on wing, and the motions of their pinions, especially at night, produce a clear whistling sound.

The fine pair from which I made the two figures in the plate were given me by my friend DANIEL WEBSTER, Esq., of Boston, Massachusetts, whose talents and accomplishments are too well known to require any eulogium from me.

The flesh of this bird is generally esteemed, insomuch that many persons know no difference between it and that of the Canvass-back Duck, for which it is not unfrequently sold; but I look upon it as far inferior to that of many other Ducks. Individuals of both sexes vary much in size. On comparing American with European skins, I am unable to perceive any difference of colour or proportions indicative of specific distinction.

RED-HEADED DUCK, *Anas Ferina*, Wils. Amer. Orn., vol. viii. p. 110.
FULIGULA FERINA, Bonap. Syn., p. 392.
FULIGULA FERINA, Swains. and Rich. F. Bor. Amer., vol. ii. p. 452.
RED-HEADED DUCK or POCHARD, Nutt. Man., vol. ii. p. 434.
RED-HEADED DUCK, *Fuligula Ferina*, Aud. Orn. Biog., vol. iv. p. 198.

Male, 20; 33. Female, 21, 32½.

Breeds throughout the Fur Countries, from which it migrates southward in early autumn. Abundant on the Chesapeake, New York Bay, Ohio, and Mississippi, with their tributaries. None seen westward of the Mississippi.

Adult Male.

Bill as long as the head, deeper than broad at the base, the margins parallel, slightly dilated towards the end, which is rounded, the frontal angles rather narrow and pointed. Upper mandible with the dorsal line at

first straight and declinate, then slightly concave, direct for a short space near the tip, where it is incurved, the ridge broad and concave at the base, narrowed at the middle, enlarged and convex at the end; the sides nearly erect at the base, becoming anteriorly more and more declinate and convex, the edges curved, with about 45 lamellæ, the unguis elliptical, and abruptly rounded at the end. Nostrils sub-medial, oblong, rather large, pervious, near the ridge, in an oblong depression covered with soft membrane. Lower mandible flattened, being but slightly convex, with the angle very long and rather narrow, the dorsal line very short and slightly convex, the erect edges with about 55 inferior lamellæ; the unguis obovate and abrupt.

Head rather large, compressed, convex above. Eyes small. Neck of moderate length, rather thick. Body full, depressed. Wings small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with narrow scutella continuous with those of the middle toe, and having another series commencing half-way down and continuous with those of the outer toe, the rest reticulated with angular scales. Hind toe small, with an inner expanded margin or web; middle toe nearly double the length of the tarsus, outer a little shorter. Claws small, compressed, that of the first toe very small and curved, of the third toe larger and more expanded than the rest.

Plumage dense, soft, blended. Feathers of the upper part of the head small and rather compact, of the rest of the head and neck small, blended, and glossy. Wings shortish, narrow, pointed; primary quills strong, tapering, the first longest, the second almost as long, the rest rapidly diminishing; secondary quills broad and rounded, the inner elongated and tapering. Tail very short, much rounded, or wedge-shaped, of fourteen feathers.

Bill light greyish-blue, with a broad band of black at the end, and a dusky patch anterior to the nostrils. Iris orange-yellow. Head and neck all round, for more than half its length, of a rich brownish-red, glossed with carmine above. A broad belt of brownish-black occupies the lower part of the neck, and the fore part of the body, of which the posterior part is of the same colour, more extended on the back than under the tail. Back and scapulars pale greyish-white, very minutely traversed by dark brownish-grey lines; the sides and abdomen similar, the undulations gradually fading away into the greyish-white of the middle of the breast; upper wing-coverts brownish-grey, the feathers faintly undulated with whitish toward the end. Primary quills brownish-grey, dusky along the outer web and at the end; secondaries ash-grey, narrowly tipped with white, the outer faintly tinged with yellow, and almost imperceptibly dotted with whitish, four or five of the inner of a purer tint, tinged with blue, and having a narrow brownish-black line along the margin; the innermost like the scapulars, but more

dusky. Tail brownish-grey, towards the end lighter. Axillar feathers and lower wing-coverts white. Feet dull greyishblue, the webs dusky, the claws black.

Length to end of tail 20 inches, to end of wings 18½, to end of claws 22; extent of wings 33; wing from flexure $9\frac{3}{12}$; tail $2\frac{8}{12}$; bill along the ridge 2, from the tips of the frontal processes $2\frac{4}{12}$; tarsus 1½, first toe and claw $1\frac{8}{12}$; second toe $1\frac{10}{12}$, its claw $\frac{3}{12}$; third toe $2\frac{5}{12}$, its claw $\frac{4}{12}$; fourth toe $2\frac{6}{12}$, its claw $\frac{3}{12}$. Weight 2½ lbs.

Adult Female.

The female has the bill of a dusky bluish-grey, with a broad band of black at the end, and a narrow transverse blue line, narrower than in the male. Iris yellow. Feet as in the male, the head and upper part of the neck dull reddish-brown, darker above, and lighter on the fore part of the cheeks and along a streak behind the eye. The rest of the neck all round, and the upper parts in general, are dull greyish-brown, the feathers paler at their extremity; the flanks and fore part of the neck dull reddish-brown, the feathers broadly tipped with pale greyish-brown. The wings are as in the male, but of a darker tint, and without undulations. The tail as in the male. Lower wing-coverts light grey, those in the middle white; middle of breast greyish-white; hind part of abdomen light brownish-grey.

Length to end of tail 21 inches, to end of claws 23½; extent of wings 32½. Weight 2 lbs. 7 oz.

The following account of the digestive organs is taken from a *British specimen*, an adult male, examined by Mr. MACGILLIVRAY in March 1836.

The tongue is 1 inch and 10 twelfths long, 6½ twelfths broad, its sides furnished with two series of bristly filaments. The œsophagus is 11 inches long, with a diameter of nearly 5 twelfths at the top, 8 twelfths at the lower part of the neck. The proventriculus has a diameter of 9 twelfths; its glandules are cylindrical, and 2 twelfths long. The stomach is an extremely powerful gizzard, of an elliptical form, compressed, oblique, its length 2½ inches, its breadth 1¾; its lateral muscles more than half an inch thick; the cuticular coat rather thin, but very tough, slightly rugous, with two circular thicker parts opposite the centres of the lateral muscles. The upper part forms a small sac, from which the duodenum comes off; the pylorus without valve. The intestine is 5 feet 4 inches long, narrowest in its upper part, where its diameter is 4 twelfths, widest at the middle, where it is 6½ twelfths, near the cœca $\frac{5}{12}$. The rectum is 5½ inches long, its diameter 6 twelfths; the cœca 7 inches long, nearly cylindrical, 4 twelfths in diameter, a little narrower at the commencement.

THE SCAUP DUCK.—FLOCKING FOWL

FULIGULA MARILA, *Linn.*

PLATE CCCXCVII.—MALE AND FEMALE.

The opinion, derived from WILSON'S account of the Scaup Duck, that it is met with only along our sea coasts, in bays, or in the mouths of rivers, as far as the tide extends, is incorrect. Had WILSON resided in the Western Country, or seen our large lakes and broad rivers during late autumn, winter, or early spring, he would have had ample opportunities of observing thousands of this species, on the Ohio, the Missouri, and the Mississippi, from Pittsburg to New Orleans. I have shot a good number of Scaup Ducks on all these rivers, where I have observed them to arrive early in October, and whence they depart between the 1st of March and the middle of April. I have not, however, seen any in small creeks, lagoons, or ponds. When they arrive on the western waters, they are seen in flocks of from fifteen to twenty individuals; but in a few weeks these flocks are joined by others, for which reason the species is named in Kentucky the "Flocking Fowl." They are, however, seldom seen close together while on the water, and they rarely associate with other birds.

The Scaup Duck seems to float less lightly than it really does, its body being comparatively flat. It moves fast, frequently sipping the water, as if to ascertain whether its favourite food be in it. Then turning its head and glancing on either side to assure itself of security, down it dives with all the agility of a Merganser, and remains a considerable time below. On emerging, it shakes its head, raises the hind part of its body, opens its short and rather curved wings, after a few flaps replaces them, and again dives in search of food. Should any person appear when it emerges, it swims off to a considerable distance, watches every movement of the intruder, and finally either returns to its former place, or flies away.

These birds are fond of large eddies below projecting points of land, but frequently dive in search of food at a considerable distance from them. When in eddies they may be approached and shot with less difficulty than when in any other situation. If wounded only, they are not easily secured; in fact, you need not go after them, for by diving, fluttering along the surface, and cutting backward and forward, they generally elude pursuit. Be-

Scaup Duck

1 Male. 2. Female.

Drawn from Nature by J.J.Audubon.FRSFLS.

Lith.ª Printed & Col.ª by J. T. Bowen. Philad.ª

tween Louisville and Shippingport, on the Kentucky side of the Ohio, the shores are from ten to fifteen feet high, and rather abrupt when the waters are at their ordinary level. The Scaup Ducks are fond of diving for food along this place, and there, by coming directly upon them unseen, till you are almost over them, you may have the very best opportunities of procuring them. They are not worth shooting, however, unless for sport or examination, for their flesh is generally tough and rather fishy in flavour. Indeed I know none, excepting what is called *an Epicure*, who could relish a Scaup Duck.

They appear to experience some difficulty in getting on wing, and assist themselves on all occasions, either by meeting the current or fronting the wind, while they also use their broad feet as helps. When danger is near, they frequently, however, prefer diving, which they find as effectual a means of security as flying. As they usually feed at some distance from each other, it is amusing to see them go off, as they emerge from the water in succession, and to watch them when they collect again, and when, after flying for a long time in circles, now high then low over the water, they all realight. These habits, and the toughness of their sinewy bodies, render it rather difficult to shoot them. Although flat-billed, they dive to a considerable depth, and when they have reached the bottom, no doubt furrow the mud, in the manner of the Shoveller (*Anas clypeata*), although the latter performs this action while floating on the surface, with its head and neck alone submersed, as it swims over the shallows.

The food of the Scaup Duck I have found to consist of small fry, crayfishes, and a mixture of such grasses as here and there grow along the beds of our rivers. I never found any portions of testaceous mollusca in the gizzards of those obtained on our western waters, although even there they might meet with abundance of these animals.

When these birds are travelling, their flight is steady, rather laborious, but greatly protracted. The whistling of their wings is heard at a considerable distance when they are passing over head. At this time they usually move in a broad front, sometimes in a continuous line. When disturbed, they fly straight forward for awhile, with less velocity than when travelling, and, if within proper distance, are easily shot. At times their notes are shrill, but at others hoarse and guttural. They are, however, rarely heard during the day, and indeed, like many other species, these birds are partly nocturnal.

At the approach of spring the Drakes pay their addresses to the females, before they set out on their journey. At that period the males become more active and lively, bowing their heads, opening their broad bills, and uttering a kind of quack, which to the listener seems produced by wind in their stomach, but notwithstanding appears to delight their chosen females.

The Scaup Duck varies materially as to size at different ages. Some wounded individuals which I kept, and which were birds of the first year, were much larger and heavier at the end of a year; and I agree with my learned friend NUTTALL, that specimens may be procured measuring from sixteen and a half to eighteen, nineteen, or twenty inches in length.

On the Atlantic coast I have met with this species from the Gulf of Mexico to the Bay of Fundy, and my friend THOMAS MACCULLOCH has told me that they are not unfrequent at Pictou in Nova Scotia. Farther north I saw none; and their breeding places are yet unknown to me.

SCAUP DUCK, *Anas Marila*, Wils. Amer. Orn., vol. viii. p. 84.
FULIGULA MARILA, *Scaup Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 456.
SCAUP DUCK, Nutt. Man., vol. ii. p. 437.
SCAUP DUCK, *Fuligula Marila*, Aud. Orn. Biog., vol. iii. p. 226; vol. v. p 614.

Male, 16½, 29. Female, 16½, 28.

Abundant during autumn on the Ohio and its tributaries, as well as those of the Missouri and the Mississippi. Rather common also along the Middle Atlantic Districts. Breeds far north.

Adult Male.

Bill as long as the head, deeper than broad at the base, enlarged and flattened towards the end, which is rounded, the frontal angles narrow and pointed. Upper mandible with the dorsal line at first straight and declinate, then slightly concave, along the unguis curved, the ridge broad at the base, narrowed at the middle, enlarged and convex towards the end, the sides nearly erect at the base, becoming more and more declinate and convex, the edges curved upwards, with about forty lamellæ, the unguis small and oblong. Nostrils sub-medial, oblong, rather large, pervious, near the ridge, in an oblong groove with a soft membrane. Lower mandible flat, with the angle very long and rather narrow, the dorsal line very short and straight, the erect edges with about sixty lamellæ,—on the upper edge, however, the lamellæ are more numerous,—the unguis broadly elliptical.

Head of moderate size. Eyes small. Neck of moderate length, rather thick. Body comparatively short, compact, and depressed. Wings small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with a series of broad scutella, externally of which is another of smaller, the rest reticulated with angular scales. Hind toe small, with a free membrane beneath; anterior toes double the length of the tarsus, united by reticulated membranes having a sinus at their free margins, the outer and inner with loose somewhat lobed marginal membranes, all obliquely scutellate above, the third and fourth about equal and longest. Claws

small, that of first toe very small and curved, of middle toe largest, with an inner thin edge, of the rest very slender and pointed.

Plumage dense, soft, blended. Feathers of the head and neck short and velvety, those of the hind head a little elongated. Wings shortish, narrow, pointed; primary quills curved, strong, tapering, the first longest, the second very little shorter, the rest rapidly graduated; secondary broad and rounded, the inner elongated and tapering. Tail very short, much rounded, of fourteen feathers.

Bill light greyish-blue, the unguis blackish. Iris yellow. Feet greyish-blue, the webs and claws black. The head, the whole neck, and the fore part of the back and breast black, the head and neck glossed with purple and green, the rest tinged with brown. Hind part of the back, rump, abdomen, and upper and lower tail-coverts, brownish-black. Middle of the back, scapulars, inner secondaries, interior part of abdomen, and sides greyish-white, beautifully marked with undulating black lines. Middle of the breast white, wings light brownish-grey. Alula, primaries at the base and end, and the greater part of secondaries, brownish-black; the speculum on the latter white.

Length to end of tail 16½ inches, to end of claws 18; extent of wings 29; wing from flexure 8¾; tail 2¾; bill along the back 1 $\frac{10}{12}$, along the edge of lower mandible 2; tarsus 1¼; middle toe 2 $\frac{2}{12}$, its claw $\frac{3}{12}$. Weight 1 lb. 6 oz.

Adult Female.

The female agrees with the male in the characters of the plumage, and in the colours of the bare parts; but those of the former differ considerably. The head, neck, and fore part of the back and breast, are umber brown; and there is a broad patch of white along the fore part of the forehead. The upper parts in general are brownish-black, the middle of the back and the scapulars undulated with whitish dots and bars. The primary quills are greyish in the middle, and the speculum is white, but of less extent than in the male. The greater part of the breast and abdomen is white; the sides and parts under the tail umber brown.

Length 16½ inches, extent of wings 28. Weight 1 lb. 6 oz.

Male. Breadth of mouth 8 twelfths; its roof broadly concave, with a median prominent line, on which are four papillæ, and at the anterior part two very short prominent lines; on the upper mandible on each side are 42 lamellæ, not projecting beyond the margin, and about 90 on the lower mandible. Tongue 1 inch 8 twelfths long, fleshy, with a deep groove above, a thin-edged series of lamellæ on each side, the tip somewhat semicircular and thin-edged. Œsophagus 8 inches long, its width from 5 twelfths to 4 twelfths, at the lower part of the neck enlarged to 6 twelfths, on entering

the thorax contracted to 3 twelfths; the proventriculus oblong, 10 twelfths in breadth. The stomach is a very muscular gizzard, of a transversely elliptical form, placed obliquely, 1 inch 8 twelfths long, 2 inches 3 twelfths broad; the right muscle 10 twelfths thick; the left 9 twelfths; the grinding surfaces of the epithelium longitudinally rugous, and of a brownish-red colour. Lobes of the liver 1½ inches and 1 inch 1 twelfth long; gall-bladder oblong, 1 inch long by 4 twelfths. The intestine makes 16 turns; its length is 4 feet 7 inches, its width 4 twelfths; duodenal fold 3 inches; cœca 4 inches 9 twelfths long, only 1½ twelfths in breadth, narrower at the base and at the extremity; rectum 3 inches 9 twelfths long, 3½ twelfths wide.

Trachea 6¼ inches long, a little flattened, carinate behind at the upper part, from 5¼ twelfths to 3¼ twelfths in breadth; its rings moderately firm, unless at the back part, where they are cartilaginous; 108 in number, with about 8 more incorporated with the tympanum, which is very large, of an irregular form, its projection on the right side having a semicircular carina, and a great portion of it being membranous; its breadth 1 inch, its greatest height 1 inch 2 twelfths. Bronchi short, one of 25 half rings, the other of 30. Muscles as usual in this family.

THE RING-NECKED DUCK.

FULIGULA RUFITORQUES, *Bonap.*

PLATE CCCXCVIII.—MALE AND FEMALE.

The Ring-necked Duck is abundant on all our western waters during autumn and winter. It is also met with along our Atlantic coasts; but there, although I have seen many individuals on the Chesapeake and other large arms of the sea, it is by no means so plentiful as in the interior. Its flesh is excellent, equalling in my opinion that of any other Duck; and when it has been feeding along the margins of rivers, creeks, or ponds, for a few weeks it becomes very fat, tender, and juicy, and has none of the fishy flavour of those species which are in the habit of diving deep for their food. In shape, the Tufted Duck, or Ring-bill, as it is called in Kentucky, resembles the Scaup or Flocking Fowl, but is plumper and more rounded.

R T

Ring-necked Duck

1. Male. 2. Female.

Drawn from Nature by J.J.Audubon,FRSFLS.

Lith.ed Printed & Col.d by J. T. Bowen. Phila.a

This bird arrives in Kentucky and the neighbouring States, as far down the Mississippi as New Orleans, from the 20th of September to the middle of October, at which latter period it may be found in the whole extent of the Union, from Massachusetts to Louisiana, being more numerous in some districts than in others, according to the suitableness of the place. They commonly move while on wing in flocks of from fifteen to twenty individuals, keeping rather scattered, and thus rarely affording what is called a good shot. They fly with rapidity, keeping at a considerable height, and the motion of their wings produces a constant whistling as they pass over head. Before alighting, they wheel and perform various evolutions, although they do not occupy so much time with them as Teals are wont to do.

They swim rather lightly and with ease, and, unlike the Scaups, experience no difficulty in rising on wing, whether from the land or from the water, but generally spring up at once, especially if alarmed. They have an almost constant practice of raising the head in a curved manner, partially erecting the occipital feathers, and emitting a note resembling the sound produced by a person blowing through a tube. At the approach of spring the males are observed repeating this action every now and then, while near the females, none of which seem to pay the least attention to their civilities.

Whilst in ponds, they feed by diving and dabbling with their bills in the mud amongst the roots of grasses, of which they eat the seeds also, as well as snails and all kinds of aquatic insects. When on rivers, their usual food consists of small fish and crays, the latter of which they procure at the bottom. A male which I shot near Louisville, in the beginning of May, exhibited a protuberance of the neck so very remarkable as to induce me to cut the skin, when I found a frog, the body of which was nearly two inches long, and which had almost choked the bird, as it allowed me to go up within a dozen or fifteen paces before I took aim. This species remains with us in the Western country later than most others of its tribe, and not unfrequently as late as the Blue-winged Teal.

We are indebted for the discovery of this species to my friend the Prince of MUSIGNANO, who first pointed out the difference between it and the Tufted Duck of Europe. The distinctions that exist in the two species he ascertained about the time of my first acquaintance with him at Philadelphia in 1824, when he was much pleased on seeing my drawing of a male and a female, which I had made in Louisville, in Kentucky, previous to WILSON'S visit to me there. WILSON supposed it identical with the European species.

The summer haunts and habits of this Duck have not been ascertained; for although Dr. RICHARDSON mentions that he found it not rare in the Fur Countries, he says nothing of its eggs or nest. While with us it has no long

crest, but I am inclined to think that at the commencement of the breeding season that appendage may be developed.

FULIGULA RUFITORQUES, Bonap. Syn., p. 393.
TUFTED DUCK, *Anas Fuligula*, Wils. Amer. Orn., vol. viii. p. 60.
RING-NECKED DUCK, *Anas (Fuligula) rufitorques*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 453.
RING-NECKED DUCK, *Fuligula rufitorques*, Nutt. Man., vol. ii. p. 439.
RING-NECKED DUCK, *Fuligula rufitorques*, Aud. Orn. Biog., vol. iii. p. 259.

Male, 18, 28. Female, 16.

Abundant on the Ohio during autumn, winter, and early spring; rather rare along the coasts of the Middle Atlantic Districts. Breeds far north.

Adult Male.

Bill about the same length as the head, rather deeper than broad at the base, depressed and enlarged towards the end, the frontal angles acute. Upper mandible with the dorsal line at first sloping, then concave, along the unguis decurved, the ridge broad and flat at the base, then broadly convex, the sides nearly flat and perpendicular at the base, convex and sloping towards the end, the edges soft, with about forty-five internal lamellæ, unguis obovate, curved. Nostrils sub-basal, lateral, rather small, oval, pervious. Lower mandible flat, with the angle very long and rather narrow, the dorsal line very short, slightly convex, the edges with about sixty-five lamellæ and smaller intermediate ones above.

Head of moderate size, neck rather long and slender, body full and depressed, wings rather small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, at its lower part anteriorly with two series of scutella, the rest covered with reticulated angular scales. Toes scutellate above, first very small, free, with a broad membrane beneath, fourth longest, third scarcely shorter; claws small, curved, compressed, obtuse, the hind one smaller, more curved and acute, that of the third toe with an inner sharp edge.

Plumage dense, soft, blended, rather glossy. Feathers of the middle of the head, and upper part of hind neck, very narrow and a little elongated; of the rest of the head and upper part of the neck very short, of the back and lower parts in general broad and rounded. Wings of moderate length, narrow, acute; primaries curved, strong, tapering, first longest, second very little shorter; secondaries broad, rounded, short, the inner long and tapering. Tail very short, rather broad, much rounded, of sixteen rounded feathers.

Bill black, with a basal band, the edges of both mandibles, and a band across the upper towards the end, pale blue. Iris yellow. Legs greyish blue, the webs brownish-black. The head, and upper part of the neck,

greenish-black, with purple reflections. A brownish-red collar, broader before, on the middle of the neck. Its lower part all round, as well as the back, scapulars, smaller wing-coverts, and posterior part of abdomen, brownish-black. Inner secondaries of the same colour, outer bluish-grey on the outer web, light brown on the inner, as are the primaries, of which the outer webs and tips are dark brown. Tail brownish-grey. Chin white, breast greyish-white, sides and fore part of abdomen greyish-white, minutely undulated with greyish-brown.

Length to end of tail 18 inches, to end of wings 16; extent of wings 28; wing from flexure $7\frac{3}{4}$; tail $2\frac{1}{2}$; bill along the back $2\frac{1}{12}$, along the edge of lower mandible $1\frac{11}{12}$; tarsus $1\frac{4}{12}$; middle toe $2\frac{3}{12}$, its claw $\frac{4}{12}$.

Adult Female.

The female has the neck umber-brown, the upper part of the head darker, the back blackish-brown, the speculum bluish-grey, as in the male, the breast brownish-white, the loral spaces and chin pale brown, the abdomen umber-brown.

Length 16 inches.

The Tufted Duck of Europe, *Fuligula cristata*, is very intimately allied to this species. The bill of the latter is longer, narrower, and differently coloured, the unguis broader at the end, as is the flat triangular space at the base of the upper mandible. The bill of the Scaup Duck is still broader towards the end, with a much narrower unguis, and the flattened part of the upper mandible still narrower than in the Tufted Duck; the colour of the speculum is also different, being bluish-grey in the Ring-necked Duck, and white in the two allied species. The females of the Ring-necked and Scaup Ducks, which are nearly similar in colour, differ in the speculum, and in the peculiar form of the bill.

RUDDY DUCK.

FULIGULA RUBIDA, *Wilsu,*

PLATE CCCXCIX.—MALE, FEMALE, AND YOUNG.

Look at this plate, reader, and tell me whether you ever saw a greater difference between young and old, or between male and female, than is apparent here. You see a fine old male in the livery of the breeding season, put on as it were expressly for the purpose of pleasing the female for awhile. The female has never been figured before; nor, I believe, has any representation been given of the young in the autumnal plumage. Besides these, you have here the young male at the approach of spring.

The Ruddy Duck is by no means a rare species in the United States; indeed I consider it quite abundant, especially during the winter months in the Peninsula of Florida, where I have shot upwards of forty in one morning. In our Eastern Districts they make their appearance early in September, and are then plentiful from Eastport to Boston, in the markets of which, as well as of New York, I have seen them. On the Ohio and Mississippi they arrive about the same period; and I have no doubt that they will be found breeding in all our Western Territories, as soon as attention is paid to such matters as the searching for nests with the view of promoting science, or of domesticating birds which might prove advantageous to the husbandman.

My friend Dr. BACHMAN informs me that this species is becoming more abundant every winter in South Carolina. In the month of February he has seen a space of the extent of an acre covered with it. Yet he has never found one in full summer plumage in that country. It is equally fond of salt or brackish and of fresh waters; and thus we find it at times on our sea-coasts, bays, and mouths of rivers, as well as on lakes and even small ponds in the interior, or on our salt marshes, provided they are not surrounded by trees, as it cannot rise high in the air unless in an open space of considerable extent. At the time of their arrival, they are seen in small flocks, more than from seven to ten being seldom found together, until they reach the Southern States, where they congregate in great flocks. When they leave their northern breeding-grounds some proceed along the coast, but a greater number along our numerous rivers.

The flight of the Ruddy Duck is rapid, with a whirring sound, occasioned

Ruddy Duck.

1. Male. 2. Female. 3. Young.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen. Phila.ª

by the concave form of the wings and their somewhat broad ends, the whistling sound produced by other species having more pointed and stiffer quills, not being heard in this, or only in a very slight degree. They rise from the water with considerable difficulty, being obliged to assist themselves with their broad webbed feet, and to run as it were on the surface for several yards, always against the breeze, when it blows smartly. The strength of the muscles of their feet enables them to spring from the ground at once. When they are fairly on wing, they fly in the same manner as most of our travelling Ducks, sustain themselves with ease, and are apt to remove to great distances. They alight on the water more heavily than most others that are not equally flattened and short in the body; but they move on that element with ease and grace, swimming deeply immersed, and procuring their food altogether by diving, at which they are extremely expert. They are generally disposed to keep under the lee of shores on all occasions. When swimming without suspicion of danger, they carry the tail elevated almost perpendicularly, and float lightly on the water; but as soon as they are alarmed, they immediately sink deeper, in the manner of the Anhinga, Grebes, and Cormorants, sometimes going out of sight without leaving a ripple on the water. On small ponds they often dive and conceal themselves among the grass along the shore, rather than attempt to escape by flying, to accomplish which with certainty they would require a large open space. I saw this very often when on the plantation of General HERNANDEZ in East Florida. If wounded, they dived and hid in the grass; but, as the ponds there were shallow, and had the bottom rather firm, I often waded out and pursued them. Then it was that I saw the curious manner in which they used their tail when swimming, employing it now as a rudder, and again with a vertical motion; the wings being also slightly opened, and brought into action as well as the feet. They are by no means shy, for I have often waded toward them with my gun until very near them, when I cared not about shooting them, but was on the look-out for a new Rail or Gallinule, along the margin of the ponds. They are often seen in company with Taels, Scaup Ducks, Gadwalls, Shovellers, and Mallards, with all of which they seem to agree.

My opinion that the males of this species lose the brightness of their spring dress before they return to us in autumn, is founded on the occurrence of multitudes of males at that season destitute of the garb in question, and my examination of many for the purpose of determining their sex and ascertaining that they were old birds. In February, 1832, I saw immense flocks of Ruddy Ducks about a hundred miles up the St. John's in Florida. They would start from the water, as our schooner advanced under sail, patting it with their feet, so as to make a curious and rather loud noise, somewhat

resembling the fall of hail-stones on the shingles. Their notes are uttered in a rather low tone, and very closely resemble those of the Female Mallard. They afford good eating when fat and young, and especially when they have been feeding for some weeks on fresh waters, where their food generally consists of the roots and blades of such grasses as spring from the bottom of rivers and ponds, as well as of the seeds of many gramineæ. When on salt marshes, they eat small univalve shells, fiddlers, and young crabs, and on the sea-coast, they devour fry of various sorts. Along with their food, they swallow great quantities of sand or gravel.

At St. Augustine, in Florida, I shot a young bird of this species immediately under the walls of the fort. Although wounded severely and with one of its legs broken close to the body, it dived at once. My Newfoundland dog leaped into the water, and on reaching the spot where the bird had disappeared, dived also, and in a few moments came up with the poor thing in his mouth. When the dog approached I observed that the Duck had seized his nose with its bill; and when I laid hold of it, it tried to bite me also. I have found this species hard to kill, and when wounded very tenacious of life, swimming and diving at times to the last gasp.

In the Fauna Boreali-Americana, the tail of the Ruddy Duck is said to be composed of sixteen feathers, and in NUTTALL'S Manual of twenty; but the number is eighteen.

RUDDY DUCK, *Anas rubida*, Wils. Amer. Orn., vol. viii. p. 137.
FULIGULA RUBIDA, Bonap. Syn., p. 390.
FULIGULA RUBIDA, *Ruddy Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 455.
RUDDY DUCK, Nutt. Man., vol. ii. p. 426.
RUDDY DUCK, *Fuligula rubida*, Aud. Orn. Biog., vol. iv. p. 326.

Male, 14$\frac{3}{4}$, 21$\frac{1}{2}$.
Adult Male in summer.

Bill as long as the head, a little higher than broad at the base, depressed and widened toward the end, which is rounded. Dorsal outline straight and declinate to the nostrils, then direct and slightly concave, the sides sloping and concave at the base, broadly convex toward the end, the edges soft, with about forty short erect lamellæ internally on each side, the unguis linear-oblong, suddenly decurved and directed backwards, its lower part transversely expanded and serrulate. Nostrils in an oblong depression covered with skin, medial, rather small, linear-oblong, pervious. Lower mandible flattened, a little recurved, its angle very long, narrow, the laminæ about a hundred and forty and extremely small, the unguis oblong.

Head rather large, oblong. Eyes of moderate size. Neck short and thick. Body full, much depressed. Legs short and placed rather far

behind; tibia bare for a short space; tarsus very short, compressed, with an anterior series of small scutella, an outer short series going to the fourth toe, the rest reticulated. Hind toe very small, with a free inferior web; anterior toes very long, slender, the middle toe double the length of the tarsus, the outer almost as long, the inner considerably shorter, and having a broad lobed margin; the webs reticulated. Claws rather small, slender, compressed, slightly arched, acute.

Plumage dense, blended, on the upper parts very soft; on the fore part of the head stiffish; on the lower parts with a silky gloss, and stiff, having the extremities broad, and the barbs strong and pointed. Wings very short, of moderate breadth, concave, pointed; primaries tapering, the first longest, obliquely rounded. Tail short, much graduated, of *eighteen* stiff, narrow feathers, of which the shaft is very strong, and runs out in a flattened concave point.

Bill and edges of eyelids greyish-blue. Iris hazel. Feet dull greyish-blue; webs inclining to dusky; claws greyish-brown. Upper part of the head and nape deep bluish-black, that colour running to a point about the middle of the neck; a large white patch on each side of the head, from the bill to behind the ear, narrowed on the throat. Neck all round, and all the upper parts, as well as the sides of the rump, rich glossy brownish-red or chestnut; the lower parts greyish-white, tinged with brown, and marked with transverse interrupted bands of dusky. Wing-coverts, quills, and tail-feathers, blackish-brown.

Length to end of tail 14¾ inches, to end of wings 12½, to end of claws 15, to carpal joint 7½; extent of wings 21½; wing from flexure 6½; tail 3½; bill along the ridge 1⅝, along the edge of lower mandible 1⅝; tarsus 1¼; hind toe and claw ⅝; inner toe 1⅜, its claw ½; middle toe 2⅜, its claw ⅜; outer toe 2⅜, its claw ¼. Weight 1¾ lbs. Average measurements of six individuals.

The black on the head of the male is sometimes marked with a few white feathers.

Adult Female in summer.

The plumage presents the same characters as in the male. The bill is of a darker greyish-blue; iris as in the male; feet darker. The top of the head, and all the upper parts, are dark reddish-brown, minutely dotted and undulated with dusky; wings and tail as in the male; lower parts duller than in the male, but similarly marked; the throat, and a band from the base of the upper mandible to beneath the eye, brownish-white.

Male one year old.

Bill, eyes, and feet as in the adult. A similar white patch on the side of the head; upper part of head and hind neck dull blackish-brown; throat and

sides of the neck greyish-brown, lower part of neck dull reddish-brown, waved with dusky; upper parts as in the adult, but of a duller tint; lower parts greyish-white.

Young in December.

Bill dusky; iris hazel; feet yellowish-green, webs dusky. All the upper parts dull reddish-brown, tinged with grey, and barred with dusky; wings and tail dark greyish-brown. Cheeks, fore part and sides of neck, and all the lower parts, dull yellowish-white, undulated with dusky; as is the rump above; the lower tail-coverts white.

The tongue of a male is 1 inch 8 twelfths long, and of the same general form as that of the Fuligulæ, but a little more dilated at the end. The œsophagus is ½ inch in diameter until its entrance into the thorax, when it contracts, and again expands to 6 twelfths, to form the proventriculus, of which the glandules are oblong, small, and very numerous, occupying a space of 2¼ inches in length. The stomach is a strong gizzard, of a roundish form, 1 inch 5 twelfths long, 1½ inches broad; its lateral muscles very large, and about 8 twelfths thick; the epithelium confined to two round spaces ½ inch in diameter, opposite the lateral muscles. The intestine is 5 feet 1½ inches long, its diameter varying from 5 twelfths to 3½ twelfths. The rectum is 2 inches 10 twelfths long; the cœca 4 inches 2 twelfths, their greatest diameter 2½ twelfths.

In another male, the œsophagus is 7½ inches long; the stomach 1 inch 5 twelfths long, 1 inch 6 twelfths broad; the intestine 5 feet 11 inches long; the rectum 2¾ inches; the cœca 4⅛ inches, their greatest diameter 2½ twelfths.

The trachea is 5¾ inches long. The thyroid bone is comparatively large, forming an expansion 7 twelfths long, 5 twelfths broad. At its upper part the trachea has a diameter of 3 twelfths, about the middle enlarges to 4 twelfths, and so continues nearly to the end, when it contracts to 2 twelfths. The last ring is very large, being formed of five or six united rings, of which the last two or three are split; but there is no expansion or tympanum as in other Ducks. The muscles are as in the other species of this family. The bronchi are of moderate length, with about 15 half rings.

Pied Duck

Drawn from Nature by J.J.Audubon FRSFLS.

Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

PIED DUCK.

FULIGULA LABRADORA, *Lath.*

PLATE CCCC.—MALE AND FEMALE.

Although no birds of this species occurred to me when I was in Labrador, my son, JOHN WOODHOUSE, and the young friends who accompanied him on the 28th of July, 1833, to Blanc Sablon, found, placed on the top of the low tangled fir-bushes, several deserted nests, which, from the report of the English clerk of the fishing establishment there, we learned to belong to the Pied Duck. They had much the appearance of those of the Eider Duck, being very large, formed externally of fir twigs, internally of dried grass, and lined with down. It would thus seem that the Pied Duck breeds earlier than most of its tribe. It is surprising that this species is not mentioned by Dr. RICHARDSON in the Fauna Boreali-Americana, as it is a very hardy bird, and is met with along the coasts of Nova Scotia, Maine, and Massachusetts, during the most severe cold of winter. My friend Professor MACCULLOCH of Pictou, has procured several in his immediate neighbourhood; and the Honourable DANIEL WEBSTER of Boston sent me a fine pair killed by himself, on the Vineyard Islands, on the coast of Massachusetts, from which I made the drawing for the plate before you. The female has not, I believe, been hitherto figured; yet the one represented was not an old bird.

The range of this species along our shores does not extend farther southward than Chesapeake Bay, where I have seen some near the influx of the St. James river. I have also met with several in the Baltimore market. Along the coast of New Jersey and Long Island it occurs in greater or less number every year. It also at times enters the Delaware river, and ascends that stream at least as far as Philadelphia. A bird-stuffer whom I knew at Camden had many fine specimens, all of which he had procured by baiting fish-hooks with the common mussel, on a "trot-line" sunk a few feet beneath the surface, but on which he never found one alive, on account of the manner in which these Ducks dive and flounder when securely hooked. All the specimens which I saw with this person, male and female, were in perfect plumage; and I have not enjoyed opportunities of seeing the changes which this species undergoes.

The Pied Duck seems to be a truly marine bird, seldom entering rivers

unless urged by stress of weather. It procures its food by diving amidst the rolling surf over sand or mud bars; although at times it comes along the shore, and searches in the manner of the Spoonbill Duck. Its usual fare consists of small shell-fish, fry, and various kinds of sea-weeds, along with which it swallows much sand and gravel. Its flight is swift, and its wings emit a whistling sound. It is usually seen in flocks of from seven to ten, probably the members of one family.

PIED DUCK, *Anas labradora*, Wils. Amer. Orn., vol. viii. p. 91.
FULIGULA LABRADORA, Bonap. Syn., p. 391.
PIED DUCK, Nutt. Man., vol. ii. p. 428.
PIED DUCK, *Fuligula labradora*, Aud. Orn. Biog., vol. iv. p. 271.

Male, 20, 30. Female, 18½, 29.

Along the shores of the Atlantic from Nova Scotia to New Jersey, rather rare, in winter. Breeds from Labrador northward. Never seen in the interior.

Adult Male.

Bill nearly as long as the head, rather broader than high at the base, the sides nearly parallel, but at the end enlarged by soft membranous expansions to the upper mandible. The latter has the dorsal outline at first straight and declinate, then direct and slightly convex, at the extremity decurved; the ridge broad at the base, convex toward the end; the sides sloping at the base, then convex, the extremity broad and rounded, the unguis broadly obovate; the margins soft, expanded toward the end, and with about 50 lamellæ, of which the anterior are inconspicuous. Nasal groove oblong, nostrils linear-oblong, sub-basal near the ridge. Lower mandible flattened, curved upwards, with the angle very long and narrow, the dorsal line very short, and nearly straight, the nearly erect edges with about 30 large and prominent lamellæ; the unguis very broad.

Head of moderate size, oblong, compressed. Eyes small. Neck rather short and thick. Body full, depressed. Feet very short, strong, placed rather far behind; tarsus very short, compressed, with two anterior series of rather small scutella, the sides and back part reticulated with angular scales. Hind toe very small, with a free membrane beneath; outer anterior toes double the length of the tarsus, and nearly equal, the inner much shorter, and with a broad marginal membrane. Claws small, slightly arched, compressed, rather acute.

Plumage dense, soft, blended; feathers of the head and neck small, oblong; toes on the lower part of the cheeks very stiff, having the terminal filaments more or less united into a horny plate. Wings short, of moderate breadth, concave, acute; primary quills curved, strong, tapering, the second

very slightly longer than the first, the rest rapidly graduated; secondary quills broad and rounded, the inner elongated and tapering. Tail very short, much rounded, of fourteen tapering feathers.

Bill with the basal space between the nostrils running into a rounded point in the middle, pale greyish-blue; the sides of the base, and the edges of both mandibles for two-thirds of their length, dull pale orange; the rest of the bill black. Iris reddish-hazel. Feet light greyish-blue, webs and claws dusky. Head and upper half of neck white, excepting an elongated black patch on the top of the head and nape. Below the middle of the neck is a black ring, from the hind part of which proceeds a longitudinal band of the same colour, gradually becoming wider on the back and rump; below the black ring anteriorly is a broad band of white, passing backwards on each side so as to include the scapulars. All the under parts black, excepting the axillaries and lower wing-coverts. Upper wing-coverts and secondary quills white, some of the inner quills with a narrow external black margin; alula, primary coverts, and primary quills, brownish-black. Tail brownish-black, tinged with grey, the shafts black; upper tail-coverts dusky, minutely dotted with reddish-brown.

Length to end of tail 20 inches, to end of claws 22½, to end of wings 18½; extent of wings 30; wing from flexure 9¼; tail 3⅝; bill along the ridge 1¼, along the edge of lower mandible 2⅛; tarsus 1½; middle toe 2⅜, its claw ⅝; hind toe 4⅛, its claw ⅜; outer toe and claw slightly longer than middle; inner toe 1⅝, its claw ⅜. Weight 1 lb. 14½ oz.

Female.

The female is less than the male. The bill, iris, and feet are coloured as in the male; sides of the forehead white (not in the figure, it having been taken from a young bird). The general colour is brownish-grey, darker on the head, cheeks, back, rump, and abdomen, of a lighter tint, approaching to ash-grey, on the throat, breast, wing-coverts, and inner secondaries, which are margined externally with black; seven or eight of the secondary quills white; the primaries and tail-feathers as in the male.

Length to end of tail 18¼ inches, to end of claws 19⅛, to end of wings 17; extent of wings 29; wing from flexure 9; tail 3½; bill along the ridge 1⅛, along the edge of lower mandible 2⅛; tarsus 1¼; hind toe and claw ⅝; middle toe and claw 2¼. Weight 1 lb. 1 oz.

THE VELVET DUCK.

FULIGULA FUSCA, *Linn.*

PLATE CCCCI.—MALE AND FEMALE.

The Velvet Duck arrives from the north along the shores of the Middle States about the first of September, and extends to a greater or less distance southward, according to the state of the weather, often proceeding as far as Georgia. The Bay of Chesapeake and all the estuaries to the eastward are amply furnished with it, and there it is usually seen in company with the American Scoter, the Golden-eyed Duck, and some other species. It very rarely enters fresh waters during its stay on our coast, and is with great propriety called a Sea Duck. My friend THOMAS NUTTALL mentions that some, which probably were young birds, had been seen in Fresh Pond near Cambridge in Massachusetts. This is the only case of the kind that I have heard of, although these birds breed in fresh water lakes and in rivers, in which they remain at the season of reproduction about two months.

In the beginning of April, the Velvet Ducks, which are gregarious, collect in large flocks, for the purpose of removing to their northern breeding places; and as they fly steadily onwards, you may see thousands passing at short distances from the shores, and forming an almost continuous line, each flock composed of twenty or thirty individuals, which fly low and irregularly, ranged in an angular form. While on the Bay of Fundy, I went with my party to a projecting cape, round which these birds passed during our stay, from daylight until evening. When it blows hard from the sea, the Ducks come near to the shore, and afford abundant opportunities to such sportsmen as are fond of shooting them.

As we approached the shores of Labrador, we found the waters covered with dense flocks of these birds, and yet they continued to arrive there from the St. Lawrence for several days in succession. We were all astonished at their numbers, which were such that we could not help imagining that all the Velvet Ducks in the world were passing before us. This was about the middle of June, which I thought late for them, but the season had been tardy, and the fishermen informed us, that when the weather is warmer, these birds pass a fortnight earlier. The greater number merely appear for a few days on their way farther north, but some remain to breed on the

Velvet Duck.

1. Male. 2. Female.

Drawn from Nature by J.J.Audubon, F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

southern coast of Labrador. Thousands of sterile individuals, however, spend the summer on the Bay of Fundy.

During the breeding season, the Velvet Duck resembles the Eider in its habits, only that it prefers fresh water, which is rarely the case with the other species. The males leave the females after incubation has commenced. Those which breed at Labrador begin to form their nests from the 1st to the 10th of June, and on the 28th of July I caught some young ones several days old. The nests are placed within a few feet of the borders of small lakes, a mile or two distant from the sea, and usually under the low boughs of the bushes, of the twigs of which, with mosses and various plants matted together, they are formed. They are large and almost flat, several inches thick, with some feathers of the female, but no down, under the eggs, which are usually six in number, intermediate in size between those of the Eider and King Ducks, measuring an inch and three quarters in length, one and seven-eighths in breadth, of a uniform pale cream-colour, tinged with green, not pure white as stated by some authors. On the 28th of July I procured five young ones out of a brood of six, among which, although to appearance scarcely a week old, I could readily distinguish the males from the females as they swam on the little pond around their mother, the former having already a white spot under the eye. The down with which they were covered was rather stiff and hair-like, of a black colour, excepting under the chin, where there was a small patch of white. They swam with great ease, and when we drove them into a narrow place for the purpose of catching them, they several times turned upon us and dived with the view of getting back to the middle of the pond, so that at last we found it necessary to shoot them. Only one escaped ashore, which my young friend THOMAS LINCOLN caught, but afterwards restored to its mother, which continued on the pond, manifesting the greatest anxiety, and calling to her brood all the while with short squeaking notes, by no means unpleasant to the ear. On being shot at, she flew off to another pond, but soon returned. Her plumage was rusty and ragged, but the wings seemed to be complete, as she flew with great ease, springing at once from the water.

Mr. JONES of Bras d'Or assured me, that either that individual or another of the same species, had bred on the same pond for six or seven years in succession, and that he had looked at the nest and observed her manners when leading about the young, which he said did not leave the pond until they were able to fly. That year, 1833, she and her mate had arrived nearly a month later than usual. This accounted for the small size of the young, which he was sorry to see dead; and here let me say that Mr. JONES, who is not only a good-hearted and benevolent man, but also fond of observing

nature, was the first person I met with who could give me any rational account of the Ducks which bred in his vicinity.

A few of the Velvet Ducks breed on the Island of Grand Manan, and in other places about the Bay of Fundy, but rarely farther south, and the number that remain in Labrador is comparatively small, as we did not observe there more than six or seven broods. They generally leave that part of the coast about the middle of August; but that season they were still seen after the Eider Ducks had departed, which makes me think that they require more warmth than these birds before they begin to lay their eggs. Captain JAMES CLARK ROSS, of the British Royal Navy, a gentleman, besides his professional merits, distinguished for his love of science, informed me that none of these birds were observed on either of his Arctic voyages. The extreme limits of their migrations remain unknown.

The flight of the Velvet Duck is strong and sustained, although it usually flies low; yet when pursued, or at the sight of gunners in a boat, it often rises to the height of forty or fifty yards, describes elegant curved lines as it passes and repasses, and thus continues to fly until danger is no longer apprehended. Its movements in the air are performed by continued flappings, and when on wing the white of the wings is beautifully contrasted with the dark hue of the rest of its plumage. It dives with as much agility as the Eider or American Scoter, and, when wounded, is equally difficult to be caught, nor can it be killed with certainty without a heavy shot.

The Velvet Ducks enter the bays and estuaries to a greater distance than the Eiders. On land they move with more difficulty than those birds, and keep themselves in a more erect attitude, like that in which I have endeavoured to represent the male in the plate. They swim with more buoyancy than the Eiders, but at times seem to rise from the water with considerable difficulty. Their food consists of shell-fish and crustacea, as well as sea-weeds, small fish, and spawn. Their flesh is extremely dark, tastes of fish, and is very unpalatable, although I have seen persons of great judgment in matters of this kind not only eat it with avidity, but praise it as highly as if it were equal to the most tender and juicy venison. They are sold in abundance in our eastern markets and those of the Middle States, at from fifty cents to a dollar the pair.

This species is, in my opinion, very closely allied to the Eider, insomuch that I frequently call it the Black King-Duck. Along our coasts it commonly receives the name of White-winged Coot. The female is smaller than the male. The young much resemble the female during the first year. The white spots of the head, however, are apparent, although mottled with dusky, and their feet now shew some of the redness of those of the old males; but I am unable to say with certainty at what age they attain their full summer

plumage, and the rich colouring of the bill. The *gizzard*, which is not so large as that of the Eider, is of a yellow colour; the gut very large, tough, and strong, about eight feet in length.

VELVET DUCK, *Anas fusca*, Wils. Amer. Orn., vol. viii. p. 137.
FULIGULA FUSCA, Bonap. Syn., p. 390.
OIDEMIA FUSCA, *Velvet Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 449.
VELVET DUCK, Nutt. Man., vol. ii. p. 419.
VELVET DUCK, *Fuligula fusca*, Aud. Orn. Biog., vol. iii. p. 354.

Male, 22, 39. Female, 22, 38.

From the coast of Georgia eastward to Nova Scotia, during winter, when it is extremely abundant in all the estuaries and bays. Breeds from Labrador northward.

Adult Male.

Bill about the length of the head, very broad, as deep as broad at the base, depressed and flattened towards the end, which is rounded. Upper mandible with a short abrupt prominence at the base, its dorsal line on the prominence straight, at its fore edge abruptly sloping, then slightly concave, and at the end curved, the ridge on the prominence very broad and nearly flat, towards the end broadly convex, the sides convex, the edges obtuse, with about thirty lamellæ, the unguis very large, and elliptical. Nostrils sub-basal, elliptical, very large, pervious, nearer the ridge than the edge, and placed on the lower side of the basal prominence. Lower mandible flat, with the angle long, rather narrow, rounded, the dorsal line slightly convex, the edges with about twenty-five lamellæ, the unguis nearly circular and very large.

Head large. Eyes rather small. Neck of moderate length, thick. Body large, and much depressed. Wings rather small. Feet very short, placed rather far behind; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a partial series, the rest covered with reticular angular scales. Hind toe small, with a free membrane beneath; anterior toes double the length of the tarsus, united by reticulated membranes having a sinus on their free margins, the inner with a lobed marginal membrane, the outer with a thick edge, the third and fourth about equal and longest. Claws small, that of first toe very small and curved, of middle toe largest, with a dilated inner edge, of the rest slender, all obtuse.

Plumage dense, soft, blended. Feathers on the fore part of the head extremely small, on the neck velvety. Wings rather short, narrow, pointed; primary quills curved, strong, tapering and pointed, the first longest, the second very little shorter, the rest rapidly graduated; secondary broad and

rounded, the inner elongated and tapering. Tail very short, narrow, wedge-shaped, of fourteen stiff narrow feathers.

Basal prominence and sides of the bill black, the sides towards the end bright red, the unguis flesh-colour, with a black line on each side. Iris bright yellow. Feet carmine on the outer side, orange-red on the inner, the webs greyish-black. The general colour of the plumage is brownish-black, on the upper parts glossed with blue, lighter on the lower. The outer secondary quills are white, and there is a spot of the same under the eye.

Length to end of tail 22 inches, to end of wings 19¼, to end of claws 24½; extent of wings 39; wing from flexure 12; tail 3½; bill $1\frac{8}{12}$, along the edge of lower mandible $2\frac{7}{12}$; tarsus $1\frac{1}{2}$; middle toe 3, its claw $\frac{5}{12}$. Weight 3 lbs. 10 oz.

Adult Male.

In the female the basal prominence of the bill is much less elevated, and the colour of the whole bill is dusky. The iris and feet are as in the male, but of duller tints. The general colour of the plumage is a sooty-brown, the breast and abdomen lighter. There are two whitish spots on each side of the head, one near the base of the upper mandible, the other behind the eye; the outer secondary quills are white, as in the male.

Length to end of tail 22 inches, to end of wings 18, to end of claws 25½; extent of wings 38; wing from flexure 11¼; tail 3½; bill $1\frac{7}{12}$, along the edge of lower mandible $2\frac{7}{12}$; tarsus 1¾; middle toe $2\frac{1}{12}$, its claw $\frac{5}{12}$. Weight 3 lbs. 3 oz.

The down of this species is similar to that of the Eider Duck, and apparently of equal quality.

Black or Surf Duck

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S. 1. Male 2. Female Lith.d Printed & Col.d by J.T. Bowen, Phila.a

SURF DUCK.

FULIGULA PERSPICILLATA, *Linn.*

PLATE CCCCII.—MALE AND FEMALE.

Although several years have elapsed since I visited the sterile country of Labrador, I yet enjoy the remembrance of my rambles there; nay, reader, many times have I wished that you and I were in it once more, especially in the winter season. I calculate indeed how easily this wish might be accomplished, were I ten years younger. Under the hospitable roof of Mr. JONES, while the tempest might be hurling southward the drifting snows, I could live in peaceful content, cheered by the matchless hand-organ of my kind hostess. Then, how pleasant it would be in calm weather to traverse the snowy wastes, to trap the cunning fox and the Jer Falcon, allured by their favourite winter food, the Rock Grouse; with what delight should I gaze on the dim red sun creeping along the southern horizon, or watch the flittering beams of the northern aurora. Now, over the glittering snow, JONES'S Esquimaux curs might swiftly convey us to his friends, here crossing the ice-bound gulf, there traversing fissures and crags impassable in summer. Then what long tales for the long nights, and sports for the short days. The broad-antlered Caribou might have scampered before me, but its bounds would have been suddenly checked by the fleeter ball of my well-directed rifle. The wolf might have prowled around us, until he had been captured in the deeply dug and well-baited pit. Then Nature's pure mantle would be seen slowly to disappear, the low grounds would be inundated with the snow-waters, the warm breezes would dry the mountain ridges, and with the first appearance of verdure joy would cause every heart to bound. Thousands of seals would be seen to snuff the milder air, myriads of tiny fishes would approach the shores, and millions of feathered wanderers would pass over on whistling pinions. But alas! I shall never spend a winter in Labrador.

While proceeding towards that country in 1828, on board the Ripley, I found the waters of the Gulf of St. Lawrence alive with Ducks of different species. The nearer we approached the coast, the more numerous did they become; and of the many kinds that presented themselves to our anxious gaze, the Surf Duck was certainly not the least numerous. It is true that in

the noble bays of our own coast, in the Sound, between New York and the Hook, on the broader waters of the Chesapeake, and beyond them to the mouths of the Mississippi, I had seen thousands of Surf Ducks; but the numbers that passed the shores of Labrador, bound for the far north, exceeded all my previous conceptions.

For more than a week after we had anchored in the lovely harbour of Little Macatina, I had been anxiously searching for the nest of this species, but in vain: the millions that sped along the shores had no regard to my wishes. At length I found that a few pairs had remained in the neighbourhood, and one morning, while in the company of Captain EMERY, searching for the nests of the Red-breasted Merganser, over a vast oozy and treacherous fresh-water marsh, I suddenly started a female Surf Duck from her treasure. We were then about five miles distant from our harbour, from which our party had come in two boats, and fully five and a half miles from the waters of the Gulf of St. Lawrence. The marsh was about three miles in length, and so unsafe that more than once we both feared, as we were crossing it, that we might never reach its margin. The nest was snugly placed amid the tall leaves of a bunch of grass, and raised fully four inches above its roots. It was entirely composed of withered and rotted weeds, the former being circularly arranged over the latter, producing a well-rounded cavity, six inches in diameter, by two and a half in depth. The borders of this inner cup were lined with the down of the bird, in the same manner as the Eider Duck's nest, and in it lay five eggs, the smallest number I have ever found in any Duck's nest. They were two inches and two and a half eighths in length, by one inch and five-eighths in their greatest breadth; more equally rounded at both ends than usual; the shell perfectly smooth, and of a uniform pale yellowish or cream-colour. I took them on board, along with the female bird, which was shot as she rose from her nest. We saw no male bird near the spot; but in the course of the same day, met with several males by themselves, about four miles distant from the marsh, as we were returning to the harbour. This induced me to believe that, like the Eider and other Ducks that breed in Labrador, the males abandon the females as soon as incubation commences. I regret that, notwithstanding all my further exertions, I did not succeed in discovering more nests or young birds.

In the States of Maine and Massachusetts, this species is best known by the name of "Butter-boat-billed Coot." The gunners of Long Island and New Jersey call it the Black Sea Duck. It is often seen along the coast of South Carolina, where my friend JOHN BACHMAN has met with it. The Surf Duck is a powerful swimmer and an expert diver. It is frequently observed fishing at the depth of several fathoms, and it floats buoyantly

among the surf or the raging billows, where it seems as unconcerned as if it were on the most tranquil waters. It rises on wing, however, with considerable difficulty, and in this respect resembles the Velvet Duck; but when once fairly under way, it flies with rapidity and to a great distance, passing close to the water during heavy gales, but at the height of forty or fifty yards in calm and pleasant weather. It is an uncommonly shy bird, and therefore difficult to be obtained, unless shot at while on wing, or when asleep, and as it were at anchor on our bays, or near the shore, for it dives as suddenly as the Velvet and Scoter Ducks, eluding even the best percussion-locked guns. The female, which was killed as she flew off from the nest, uttered a rough uncouth guttural cry, somewhat resembling that of the Goosander on similar occasions; and I have never heard any other sound from either sex.

The migration of the Surf Ducks eastward from our southern coast, begins at a very early season, as in the beginning of March none are to be seen in the New Orleans markets. When I was at Eastport in Maine, on the 7th of May, 1833, they were all proceeding eastward. How far up the St. Lawrence they advance in winter I have not learned, but they must give a decided preference to the waters of that noble stream, if I may judge by the vast numbers which I saw apparently coming from them as we approached the Labrador coast. I have never seen this species on any fresh-water lake or river, in any part of the interior, and therefore consider it as truly a marine Duck.

During their stay with us, they are always seen in considerable numbers together, and, unless perhaps during the breeding season, they seem to be gregarious; for even during their travels northward they always move in large and compact bodies. When I was at Newfoundland, I was assured that they breed there in considerable numbers on the lakes of the interior. My friend Professor MacCulloch, of Pictou, however, informs me that none are seen in Nova Scotia in summer. A gentleman of Boston, with whom I once crossed the Atlantic, assured me that the species is extremely abundant on the northern shores of the Pacific Ocean, and about the mouth of Mackenzie's river. Mr. Townsend mentions it as being also found on the Columbia. It appears that a single specimen of the Surf Duck has been procured on the shores of Great Britain; and this has induced the ornithologists of that country to introduce it as a constituent of its Fauna.

In all the individuals which I have examined, I have found the stomach to contain fish of different kinds, several species of shell-fish, and quantities of gravel and sand, some of the fragments being of large size. Their flesh is tough, rank, and fishy, so as to be scarcely fit for food.

In the young males, in the month of September, the whole upper plumage

is mottled with darkish-brown and greyish-white, the latter colour margining most of the feathers. The neck has a considerable extent of dull greyish-white, spread over two or three inches, and approaching toward the cheeks and throat. This colour disappears about the beginning of January, when they become of a more uniform dark tint, the upper part of the head brownish-black, without any white spot; there is a patch of brownish-white at the base of the upper mandible on each side; another of an oblong form over the ear, and on the nape are elongated greyish-white marks; the bill and feet dusky-green, the iris brown.

BLACK OR SURF DUCK, *Anas perspicillata*, Wils. Amer. Orn., vol. viii. p. 49.
FULIGULA PERSPICILLATA, Bonap. Syn., p. 389.
OIDEMIA PERSPICILLATA, *Surf Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 449.
BLACK OR SURF DUCK, Nutt. Man., vol. ii. p. 416.
SURF DUCK, *Fuligula perspicillata*, Aud. Orn. Biog., vol. iv. p. 161.

Male, 20, 33½. Female, 19, 31½.

Abundant from Nova Scotia to Maryland during winter, and removing southward to the mouth of the Mississippi in severe weather. Never seen in the interior. Breeds from Labrador northwards.

Adult Male.

Bill about the length of the head, very broad, as deep as broad at the base, depressed towards the end, which is rounded. Upper mandible with the dorsal outline convex and descending, before the nostrils concave, on the unguis convex and declinate; the ridge broad and convex at the base; the sides at the base erect, bulging, and very broad, towards the end convex, the edges soft, with about 30 internal lamellæ, for two-thirds from the base they are nearly parallel and straight, but towards the end ascending, the unguis very soft, somewhat triangular and rounded. Lower mandible flattened, with the angle long and rather narrow, the dorsal line slightly convex, the edges with about 35 lamellæ. Nostrils sub-medial, elliptical, large, pervious, near the ridge.

Head large, oblong, flattened above. Eyes of moderate size. Neck short and thick. Body large, and much depressed. Feet short, placed rather far behind; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a partial series, the rest covered with reticular angular scales. Hind toe small, with a free membrane beneath; anterior toes nearly double the length of the tarsus, connected by reticulated membranes having a sinus on their free margins, the inner with a lobed marginal membrane, the outer with a thick margin, the third and fourth about equal and longest. Claws small, that of the first toe very

small and curved, of the middle toe largest, with a dilated inner edge, of the rest slender, all rather obtuse.

Plumage soft, dense, blended, and glossy. Feathers on the head and neck of a velvety texture. Wings rather short, narrow, and pointed; primary quills curved, strong, tapering, and pointed, the first longest, the second little shorter, the rest rapidly graduated; secondaries broad and rounded, the inner elongated and tapering. Tail very short, narrow, wedge-shaped, of fourteen stiff, narrow, pointed feathers.

Upper mandible with a nearly square black patch at the base, margined with orange, unless in front, where there is a patch of bluish-white extending to near the nostrils, prominent part over the nostrils deep reddish-orange, becoming lighter towards the unguis, and shaded into rich yellow towards the margins; the unguis dingy greyish-yellow; lower mandible flesh-coloured, unguis darker. Iris bright yellowish-white. Tarsi and toes orange-red, the webs dusky, tinged with green; claws black. The plumage is of a deep black, glossed with blue. On the top of the head, between the eyes, is a roundish patch of white, and on the nape a larger patch of an elongated form.

Length to end of tail 20 inches, to end of wings 18, to end of claws 22; extent of wings 33½; bill from the angle in front 1½; from the prominence at the base 2½; along the edge of lower mandible 2$\frac{5}{12}$; wing from flexure 9¾; tail 3¾; tarsus 1$\frac{7}{12}$; first toe and claw 1$\frac{1}{12}$; outer toe and claw 2¼; middle toe and claw $\frac{1}{12}$ longer. Weight 2 lbs. 7 oz.

Adult Female.

Bill greenish-black; iris as in the male; feet yellowish-orange, webs greyish-dusky, claws black. The general colour of the plumage is brownish-black; darker on the top of the head, the back, wings, and tail; on the breast and sides the feathers edged with dull greyish-white.

Length to end of tail 19 inches, to end of wings 15¾, to end of claws 18; extent of wings 31½; wing from flexure 8¾; tarsus 1⅛; middle toe 2¼, hind toe $\frac{9}{12}$. Weight 2 lbs. 2 oz.

In an adult male, the tongue is 1 inch 9 twelfths long, has numerous conical papillæ at the base, is deeply grooved along the middle, has two lateral series of bristles, and terminates in a thin rounded lobe, 2 twelfths long. On the middle line of the upper mandible are about ten short conical papillæ, and on each of its margins about 35 lamellæ; on the lower an equal number. The heart is 1 inch 8 twelfths long, 1 inch 2 twelfths broad. The œsophagus, 8½ inches long, is wide, its diameter at the upper part being 1 inch, towards the middle of the neck 1¼ inches. The proventriculus is 1¼ inches long; its glandules cylindrical, 1½ twelfths in length, and, as in all other ducks, arranged so as to form a complete belt. The stomach is a powerful gizzard of a roundish form, 1 inch 10 twelfths long, 1 inch 10

twelfths broad, its lateral muscles very large, the right 10 twelfths thick, the left 9 twelfths. In the stomach were various small bivalve shells and much gravel. The cuticular lining longitudinally rugous; the grinding plates ⅜ inch in diameter. The intestine, 5 feet 7 inches in length, has an average diameter of 6 twelfths. The rectum is 7½ inches long, 8 twelfths in diameter. Of the cœca one is 3 inches 4 twelfths long, cylindrical, obtuse, 2½ twelfths in diameter, the other 4½ inches long.

The aperture of the glottis is 8 twelfths long, with numerous minute papillæ behind. The trachea presents the same structure as that of the Velvet Duck. Its upper rings, to the number of 9, are very narrow, and continuous with a large bony expansion 7 twelfths long, and 8 twelfths broad. Beyond this part its diameter is 5 twelfths, gradually diminishes to 3 twelfths about the middle, then enlarges to 5 twelfths. In this part the number of rings is 78. Then comes a roundish or transversely elliptical enlargement, 1 inch 2 twelfths in breadth, 9 twelfths in length, convex before, slightly concave behind, and composed of about 12 united rings. The trachea then contracts to 4 twelfths and presently enlarges to form the inferior larynx, which is large, ossified, but symmetrical. In this space there are 6 distinct rings, and 10 united. The entire length of the trachea is 7½ inches, its rings are all osseous and strong. The contractor muscles are very strong, pass along the sides of the lower dilatation, on which are given off the cleido-tracheals, then continue to the commencement of the inferior larynx, where the sterno-tracheals come off. The bronchial half-rings 25, unossified.

The cavity of the nose is very large, being 2 inches long, ½ inch in diameter at the lower part, continued narrow in front over the dilatation causing the external protuberance of the base of the bill. The olfactory nerves are of moderate size; the maxillary branches of the fifth pair very large.

American Scoter Duck.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

1. Male. 2. Female

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

AMERICAN SCOTER DUCK.

FULIGULA AMERICANA, *Swains.*

PLATE CCCCIII.—MALE AND FEMALE.

The American Scoter ranges along the whole coast of our Atlantic States in the latter part of autumn and during the winter, extending as far southward as the mouths of the Mississippi, beyond which I have not observed it. A few pairs breed on the shores of Labrador, but the great body of these birds proceed farther north, although the limits of their migration in that direction are as yet unknown.

On the 11th of July, 1833, a nest of this bird was found by my young companions in Labrador. It was placed at the distance of about two yards from the margin of a large fresh-water pond, about a mile from the shore of the Gulf of St. Lawrence, under a low fir, in the manner often adopted by the Eider Duck, the nest of which it somewhat resembled, although it was much smaller. It was composed externally of small sticks, moss, and grasses, lined with down, in smaller quantity than that found in the nest of the bird just mentioned, and mixed with feathers. The eggs, which were ready to be hatched, were eight in number, two inches in length, an inch and five-eighths in breadth, of an oval form, smooth, and of a uniform pale yellowish colour. I afterwards found a female with seven young ones, of which she took such effectual care that none of them fell into our hands. On several occasions, when they were fatigued by diving, she received them all on her back, and swimming deeply, though very fast, took them to the shore, where the little things lay close among the tall grass and low tangled bushes. In this species, as in others, the male forsakes the female as soon as incubation commences.

This bird usually flies low over the water, although its flight is swift and well sustained. On land it moves more awkwardly than the Eider Duck, but in diving it is perhaps superior to that species. During their stay along our shores, they congregate in vast multitudes, and being often shot on wing in numbers, are sold in all the markets of our maritime cities; but their flesh is very dark and has a strong fishy flavour, so as to be very unsavoury. It sometimes happens that during violent gales the Scoter is forced into fresh-water rivers, from which, however, it returns to the salt bays, inlets, or outer

sandy shallows of the coast, as soon as the weather permits. They are extremely abundant about Boston, New York, the New Jersey shores, and the Chesapeake; but less so to the southward, until you reach the salt lakes about New Orleans. Their food consists of shell-fish of small size, marine plants, and insects.

The difference between this species and the European bird of the same name, *Fuligula nigra*, being now well known, it is unnecessary to say any thing on the subject. I have given figures of the adult male and female, but am not acquainted with the changes which the plumage undergoes. The young are covered with pure black hair-like down. In the winter season, at which time the male in the plate was drawn, the colour of the bill is much less bright than in spring, or during the period of breeding, when the males, after they have left the females, associate together in parties, and moult in August.

It has been supposed that we have two species confounded under the common name of Scoter; but I have not succeeded in finding more than one, and my zealous young friend, Dr. THOMAS M. BREWER, of Boston, who is quite competent to the task, has been equally unsuccessful, although in the course of the last two years he has examined a great number of individuals.

SCOTER DUCK, *Anas nigra*, Wils. Amer. Orn., vol. viii. p. 135.

FULIGULA NIGRA, Bonap. Syn., p. 390.

OIDEMIA AMERICANA, *Swains. American Scoter*, Swans. and Rich. F. Bor. Amer., vol. ii. p. 450.

AMERICAN SCOTER DUCK, *Fuligula americana*, Nutt. Man., vol. ii. p. 422.

AMERICAN SCOTER DUCK, *Fuligula americana*, Aud. Orn. Biog., vol. v. p. 117.

Male, 29, 33½. Female, 17, 29½.

In winter abundant in the Bays of Boston, New York, and Chesapeake, and as far south as the mouth of the Mississippi. Never inland. Breeds from Labrador to the Arctic seas.

Adult Male.

Bill a little shorter than the head, very broad, higher than broad at the base, much depressed toward the end, which is semi-elliptical. Upper mandible with the dorsal outline convex at the base, descending and concave in the middle, again convex toward the end; the basal part tumid with a median groove, the ridge broad and slightly convex between the nostrils, the sides at first nearly erect and concave, gradually becoming more depressed and convex, the sides soft, internally lamellate, nearly parallel for half their length, dilating a little to beyond the nostrils, then contracting; the unguis very large, broadly elliptical. Lower mandible flattened, with the angle long and rather narrow, the dorsal line slightly convex, the edges parallel.

the tip rounded, the unguis very broadly elliptical. Nostrils medial, elliptical, pervious, near the ridge.

Head large, oblong, compressed, rounded above. Eyes of moderate size, Neck short and thick. Body large and much depressed. Feet very short, placed rather far behind; tarsus very short, much compressed, having anteriorly in its whole length a series of small scutella and above the outer toe a partial series, the rest covered with reticular angular scales. Hind toe small, with a free membrane beneath; anterior toes nearly double the length of the tarsus, connected by reticulated membranes having a sinus on their free margins, the inner with a lobed marginal membrane, the outer with a thick margin, the third and fourth about equal and longest. Claws small, that of the first toe very small and curved, of the middle toe largest with a dilated inner edge, of the rest slender, all rather obtuse.

Plumage soft, dense, blended, slightly glossed. Feathers on the head and neck of a velvety texture, being very small, oblong, with the terminal filaments disunited. Wings rather short, narrow, and pointed; primary quills curved, strong, tapering, pointed, the first with the inner web cut out towards the tip, leaving the feather less than a quarter of an inch in breadth at the distance of an inch and a half from its extremity; the second longest, exceeding the first by half an inch, and the third by one-twelfth, the rest rapidly graduated; secondaries broad and rounded, the inner elongated and tapering. Tail very short, graduated, acuminate, of sixteen pointed feathers.

The bulging part of the upper mandible is bright orange, paler above, that colour extending to a little before the nostrils; the rest of the upper mandible, including its basal margin to the breadth of from three to two twelfths of an inch, black, as is the lower mandible. Iris brown. Feet brownish-black. The general colour of the plumage is black, on the lower parts tinged with brown; the inner webs of the quills brownish-grey.

Length to end of tail 19 inches, to end of wings 17, to end of claws 20; extent of wings 33½; bill along the ridge 1$\frac{11}{12}$; wing from flexure 9$\frac{4}{12}$; tail 4; bare part of tibia $\frac{4}{12}$; tarsus 1$\frac{9}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{3}{12}$; second toe 2$\frac{2}{12}$, its claw $\frac{4}{12}$; third toe 2$\frac{9}{12}$, its claw $\frac{5}{12}$; fourth toe 2$\frac{1}{12}$, its claw $\frac{3}{12}$. Weight 2 lbs. 9 oz.

Adult Female.

The female, which is a little smaller than the male, has scarcely any protuberance at the base of the bill, which is entirely brownish-black. The upper parts are of a light sooty-brown colour, the lower light brownish-grey.

Length to end of tail 17 inches; extent of wings 29¾.

This species differs very little from the European Scoter, being nearly of the same size, proportions, and colours. The male differs from that of the

other species in having the sides of the unguis narrowed, and the orango patch on the upper mandible less extended beyond the nostrils, and destitute of the median black line and lateral streak. There is less difference in the colour of the plumage, however, than has been represented; for adult males of this species are not sooty-brown above, but deep black.

An adult male, from Dr. T. M. Brewer, of Boston. The roof of the mouth is very concave and broad, with a median ridge, on which there are six papillæ towards the base. There are about 25 large lamellæ on each side of the upper mandible, besides a number of smaller ones anteriorly; about 40 on each side of the lower mandible. The tongue is 1 inch 10 twelfths long, its greatest breadth 9½ twelfths; the papillæ at the base long and pointed, the sides furnished with two rows of bristles, the tip thin-edged and rounded. The aperture of the glottis, and that of the posterior nares, are beset with minute papillæ. The œsophagus is 10½ inches long, of moderate width, its greatest diameter being 10 twelfths; that of the proventriculus 1 inch. The stomach is a strong gizzard of moderate size, 1½ inches in length, and 1 inch 10 twelfths in breadth; its left lateral muscle 10 twelfths in thickness, the other 9 twelfths; the epithelium tough, dense, forming two roundish slightly concave grinding surfaces. The proventricular glandules, which are rather small, of a roundish form, 1½ twelfths long, form a belt 1¼ inches in breadth. The contents of the stomach are particles of quartz. The intestine is 4 feet 11 inches long, rather wide, its diameter pretty uniform, and about 4½ twelfths. The cœca, which come off at the distance of 4 inches from the extremity of the gut, are 8 inches in length, 2½ twelfths in their greatest diameter, with the extremity obtuse.

The trachea is 6½ inches long, flattened, its breadth 5 twelfths, contracting at the lower part to 4 twelfths. Its rings are but partially ossified, being cartilaginous at the back part. It is entirely destitute of those remarkable dilatations seen on the trachea of *Fuligula perspicillata* and *F. fusca*. The bronchi, however, are of very large size, being 1 inch 4 twelfths long, their greatest breadth ½ inch. The inferior larynx is very small, being only 3½ twelfths in breadth, in which respect it differs from that of most other male ducks. It is indeed very remarkable that this species, so nearly allied to the Velvet and Surf Ducks, should present no dilatations, either at the upper larynx, or in the course of the trachea, as are seen in them. This fact is one of many tending to shew that the strictest affinity in some points of structure is not always accompanied with a strict resemblance in some of the organs supposed to exhibit generic peculiarities. The trachea of the male of this species merely resembles that of the female of the other species. Its rings are about 100; those of the bronchi 30. The contractor muscles are strong, and terminate at the commencement of the lower larynx. There are cleido-tracheal and sterno-tracheal muscles, but no inferior laryngeal.

King Duck

1 Male. 2 Female

Drawn from Nature by J.J.Audubon.F.R.S.E.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen. Philad.ª

THE KING DUCK.

FULIGULA SPECTABILIS, *Linn.*

PLATE CCCCIV.—MALE AND FEMALE.

This beautiful species rarely advances farther south along our eastern coast than the neighbourhood of the Bay of Boston. I have, however, been assured by old and trustworthy gunners that the King Duck, about thirty years ago, was by no means of rare occurrence there during winter, and that a few had been known to breed in company with the Eider along the coast. At the period of my arrival at Labrador, the greater number of the King Ducks had proceeded farther north; and although some were seen there, we found none of their nests. I can say nothing of the habits of this bird, which, although they may be similar to those of the Eider, must yet differ in many particulars, as is the case with all birds that are nearly allied in form. The eggs of the King Duck collected by Captain JAMES CLARK ROSS, R. N., measure two inches and five-eighths by one inch and three-fourths, and have a smooth shell, of a uniform dull greenish-colour.

FULIGULA SPECTABILIS, Bonap. Syn., p. 389.
SOMATERIA SPECTABILIS, *King Duck*, Swains and Rich. F. Bor. Amer., vol. ii. p. 447.
KING DUCK, *Fuligula spectabilis*, Nutt. Man., vol. ii. p. 414.
KING DUCK, *Fuligula spectabilis*, Aud. Orn. Biog., vol. iii. p. 523.

Male, 25; wing, 11¼. Female, 20; wing, 10½.

Rare in Massachusetts during winter. Breeds from Labrador to the Arctic Seas.

Adult Male.

Bill shorter than the head, much deeper than broad at the base, somewhat depressed towards the end, which is broad and rounded. Upper mandible with a soft tumid compressed substance at the base, extending perpendicularly upon the forehead, and by a medial band of feathers divided into two broad lobes, the dorsal line beyond this descending to the unguis, then slightly curved, the ridge broadly convex, the sides sloping and convex, the edges perpendicular, with about forty-five narrow internal lamellæ, the unguis very large, broadly elliptical. Nostrils sub-medial, oblong, large, pervious, near the ridge. Lower mandible flattened, with the angle very

long, rather narrow and rounded, the dorsal line short and slightly convex, the edges with about fifty lamellæ, the unguis very large and elliptical.

Head large, compressed. Neck rather short. Body bulky and much depressed. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly having a series of narrow scutella in its whole length, and a partial series above the fourth toe, the rest reticulated with angular and oblong scales; hind toe small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes having a sinus at their free margins, the inner with a broad lobed marginal membrane, the outer with a thickened edge; all obliquely scutellate above; the third and fourth about equal and longest. Claws small, arched, compressed, obtuse, that of first toe very small and more curved, of middle toe largest, more depressed, and with a dilated inner edge.

Plumage short, dense, blended. Feathers on the fore part of the head extremely small, on the upper part very narrow, on the sides of the head very short, stiff, and hair-like. Wings rather short, narrow, and pointed; primary quills curved, strong, tapering, the second longest, the first almost as long, the rest rapidly graduated; secondaries short, broad, rounded, excepting the inner, which are elongated, tapering, and curved outwards. Tail very short, much rounded, of fourteen stiff narrow feathers.

Bill flesh-coloured, the sides of the upper mandible and the soft frontal lobes bright orange. Iris bright yellow. Feet dull orange, the webs dusky, the claws brownish-black. The band of feathers separating the frontal lobes, and those along their upper and posterior edges, black; lower eyelid, and a forked patch on the throat, the same. The upper part of the head light purplish-grey; the hair-like feathers on the sides of the head pale bluish-green; the fore neck cream-coloured; the sides and hind part of the neck, a patch on the wings, and another on each side of the rump, white. The hind part of the back, the scapulars, the larger wing-coverts, and the secondary quills, brownish-black, the latter glossed with green; primary quills and tail blackish-brown. Breast and abdomen blackish-brown; lower wing-coverts white, the outer brown.

Length to end of tail 25 inches, to end of wings 23; wing from flexure $11\frac{1}{4}$; tail $3\frac{3}{4}$; bill from the base of the tumid part $1\frac{1}{4}$, along the edge of lower mandible $2\frac{5}{12}$; tarsus $1\frac{3}{4}$; middle toe $2\frac{1}{12}$, its claw $\frac{1}{3}$.

Adult Female.

The female differs greatly from the male. The bill is shorter, its tumid basal lobes narrow and not ascending perpendicularly, so that the forehead is low as in most Ducks. The feathers of the head and upper part of the neck are small, soft, and uniform. The colour of the bill is pale greenish-grey; the iris dull yellow; the feet dull ochre. The head and neck are pale grey.

Nº 81.
Pl. 405
Eider Duck
1. Male 2. Female.
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
Lith^d Printed & Col^d by J. T. Bowen Phila^d

ish-yellow, with small lines of brownish-black. The feathers of the back are brownish-black towards the end, with yellowish-grey edges, the scapulars brownish-red on the margins. The quills and tail-feathers are deep greyish-brown; the recurved secondaries broadly edged externally with yellowish-grey. The fore part of the lower neck and breast, the sides, and lower tail-coverts, have a central mark and sub-marginal band of brownish-black, the middle of the breast scarcely spotted, being of the general colour of the lower parts, which is pale yellowish-brown.

Length to end of tail 20 inches, to end of wings 17; wing from flexure $10\frac{1}{2}$; tail $3\frac{3}{4}$; bill from the separation of the lobes $1\frac{1}{4}$; tarsus $1\frac{8}{12}$; middle toe $2\frac{1}{2}$, its claw $\frac{4}{8}$.

THE EIDER DUCK.

FULIGULA MOLLISSIMA, *Linn.*

PLATE CCCCV.—MALES AND FEMALE.

The history of this remarkable Duck must ever be looked upon with great interest by the student of nature. The depressed form of its body, the singular shape of its bill, the beautiful colouring of its plumage, the value of its down as an article of commerce, and the nature of its haunts, render it a very remarkable species. Considering it as such, I shall endeavour to lay before you as full an account of it as I have been able to obtain from my own observation.

The fact that the Eider Duck breeds on our eastern coasts, must be interesting to the American ornithologist, whose fauna possesses but few birds of this family that do so. The Fuligulæ are distinguished from all other Ducks that feed in fresh or salt water, by the comparative shortness of the neck, the great expansion of their feet, the more depressed form of their body, and their power of diving to a considerable depth, in order to reach the beds on which their favourite shelly food abounds. Their flight, too, differs from that of the true Ducks, inasmuch as it is performed nearer the surface of the water. Rarely, indeed, do the Fuligulæ fly at any considerable height over that element, and with the exception of three species, they are rarely

met with inland, unless when driven thither by storms. They differ, moreover, in their propensity to breed in communities, and often at a very small distance from each other. Lastly, they are in general more ready to abandon their females, the moment incubation has commenced. Thus the female is left in a state of double responsibility, which she meets, however, with a courage equal to the occasion, although alone and unprotected.

The Eider is now seldom seen farther south along our eastern coast than the vicinity of New York. WILSON says they are occasionally observed as far as the Capes of Delaware; but at the present day this must be an extremely rare occurrence, for the fishermen of the Jerseys informed me that they knew nothing of this Duck. In WILSON'S time, however, it bred in considerable numbers, from Boston to the Bay of Fundy, and it is still to be met with on the rocky shores and islands between these points. Farther to the eastward they become more and more plentiful, until you reach Labrador, to which thousands of pairs annually resort, to breed and spend the short summer. Many, however, proceed much farther north; but, as usual, I will here confine myself to my own observations.

In the latter part of October 1832, the Eiders were seen in considerable numbers in the Bay of Boston. A large bagful of them was brought to me by a fisherman-gunner in my employ, a person advanced in years, formerly a brave tar, and one whom I feel some pride in telling you I assisted in obtaining a small pension from our government, being supported in my application by two of my Boston friends, the one the generous GEORGE PARKMAN, M. D., the other that great statesman JOHN QUINCY ADAMS. The old man had once served under my father, and to receive a bagful of Eider Ducks from him was a gratification which you may more easily conceive than I can describe. Well, there were the Ducks, all turned out on the floor; young males still resembling their mother, others of more advanced age, and several males and females complete in all their parts, only that the bills of the former had lost the orange tint, which that part exhibits during a few weeks of the breeding season. Twenty-one there were in all, and they had been killed in a single day by the veteran and his son. Those masterly gunners told me that to procure this species, they were in the habit of anchoring their small vessel about fifty yards off the rocky isles round which these birds harbour and feed at this season. There, while the birds were passing on wing, although usually in long lines, they could now and then kill two of them at a shot. Sometimes the King Eider was also procured under similar circumstances, as the two species are wont to associate together during winter. At Boston the Eiders sold that winter at from fifty to seventy-five cents the pair, and they are much sought after by epicures.

On the 31st of May, 1833, my son and party killed six Eiders on the island of Grand Manan, off the Bay of Fundy, where the birds were seen in considerable numbers, and were just beginning to breed. A nest containing two eggs, but not a particle of down, was found at a distance of more than fifty yards from the water.

Immediately after landing on the coast of Labrador, on the 18th of June in the same year, we saw a great number of "Sea Ducks," as the gunners and fishermen on that coast, as well as on our own, call the Eiders and some other species. On visiting an island in "Partridge Bay," we procured several females. The birds there paid little attention to us, and some allowed us to approach within a few feet before they left their nests, which were so numerous that a small boat-load might have been collected, had the party been inclined. They were all placed amid the short grass growing in the fissures of the rock, and therefore in rows, as it were. The eggs were generally five or six, in several instances eight, and in one ten. Not a male bird was to be seen. At the first discharge of the guns, all the sitting birds flew off and alighted in the sea, at a distance of about a hundred yards. They then collected, splashed up the water, and washed themselves, until the boat left the place. Many of the nests were unprovided with down; some had more or less than others, and some, from which the female was absent when the party landed, were quite covered with it, and the eggs felt warm to the hand. The musquitoes and flies were there as abundant and as tormenting as in any of the Florida swamps.

On the 24th of the same month, two male Eiders, much advanced in the moult, were shot out of a flock all composed of individuals of the same sex. While rambling over the moss-covered shores of a small pond, on the 7th of July, we saw two females with their young on the water. As we approached the edges, the old birds lowered their heads and swam off with those parts lying flat on the surface, while the young followed so close as almost to touch them. On firing at them without shot, they all dived at once, but rose again in a moment, the mothers quacking and murmuring. The young dived again, and we saw no more of them; the old birds took to wing, and, flying over the hills, made for the sea, from which we were fully a mile distant. How their young were to reach it was at that time to me a riddle; but was afterwards rendered intelligible, as you will see in the sequel. On the 9th of July, while taking an evening walk, I saw flocks of female Eiders without broods. They were in deep moult, kept close to the shore in a bay, and were probably sterile birds. On my way back to the vessel, the captain and I started a female from a broad flat rock, more than a hundred yards from the water, and, on reaching the spot, we found her nest, which was placed on the bare surface, without a blade of grass within five yards of it.

It was of the usual bulky construction, and contained five eggs, deeply buried in down. She flew round us until we retired, when we had the pleasure to see her alight, walk to her nest, and compose herself upon it.

Large flocks of males kept apart, and frequented the distant sea islands at this period, when scarcely any were able to fly to any distance, although they swam about from one island to another with great ease. Before their moulting had commenced, or fully a month earlier, these male birds, we observed, flew in long lines from place to place around the outermost islands every morning and evening, thus securing themselves from their enemies, and roosted in numbers close together on some particular rock difficult to be approached by boats, where they remained during the short night. By the 1st of August scarcely an Eider Duck was to be seen on the coast of Labrador. The young were then able to fly, the old birds had nearly completed their moult, and all were moving southward.

Having now afforded you some idea of the migrations and general habits of this interesting bird from spring to the close of the short summer of the desolate regions of Labrador, I proceed, with my journals before me, and my memory refreshed by reading my notes, to furnish you with such details as may perhaps induce you to study its habits in other parts of the world.

The Eider Duck generally arrives on the coasts of Newfoundland and Labrador about the 1st of May, nearly a fortnight before the waters of the Gulf of St. Lawrence are freed from ice. None are seen there during winter, and their first appearance is looked upon with pleasure by the few residents as an assurance of the commencement of the summer season. At this period they are seen passing in long files not many feet above the ice or the surface of the water, along the main shores, and around the inner bays or islands, as if in search of the places where they had formerly nestled, or where they had been hatched. All the birds appear to be paired, and in perfect plumage. After a few days, during which they rest themselves on the shores fronting the south, most of them remove to the islands that border the coast, at distances varying from half a mile to five or six miles. The rest seek for places in which to form their nests, along the craggy shores, or by the borders of the stunted fir woods not far from the water, a few proceeding as far as about a mile into the interior. They are now seen only in pairs, and they soon form their nests. I have never had an opportunity of observing their courtships, nor have I received any account of them worthy of particular notice.

In Labrador, the Eider Ducks begin to form their nests about the last week of May. Some resort to islands scantily furnished with grass, near the tufts of which they construct their nests; others form them beneath the spreading boughs of the stunted firs, and in such places, five, six, or even

eight are sometimes found beneath a single bush. Many are placed on the sheltered shelvings of rocks a few feet above high-water mark, but none at any considerable elevation, at least none of my party, including the sailors, found any in such a position. The nest, which is sunk as much as possible into the ground, is formed of sea-weeds, mosses, and dried twigs, so matted and interlaced as to give an appearance of neatness to the central cavity, which rarely exceeds seven inches in diameter. In the beginning of June the eggs are deposited, the male attending upon the female the whole time. The eggs, which are regularly placed on the moss and weeds of the nest, without any down, are generally from five to seven, three inches in length, two inches and one-eighth in breadth, being thus much larger than those of the Domestic Duck, of a regular oval form, smooth-shelled, and of a uniform pale olive-green. I may here mention, by the way, that they afford delicious eating. I have not been able to ascertain the precise period of incubation. If the female is not disturbed, or her eggs removed or destroyed, she lays only one set in the season, and as soon as she begins to sit the male leaves her. When the full complement of eggs has been laid, she begins to pluck some down from the lower parts of her body; this operation is daily continued for some time, until the roots of the feathers, as far forward as she can reach, are quite bare, and as clean as a wood from which the undergrowth has been cleared away. This down she disposes beneath and around the eggs. When she leaves the nest to go in search of food, she places it over the eggs, and in this manner, it may be presumed to keep up their warmth, although it does not always insure their safety, for the Black-backed Gull is apt to remove the covering, and suck or otherwise destroy the eggs.

No sooner are the young hatched than they are led to the water, even when it is a mile distant, and the travelling difficult, both for the parent bird and her brood; but when it happens that the nest has been placed among rocks over the water, the Eider, like the Wood Duck, carries the young in her bill to their favourite element. I felt very anxious to find a nest placed over a soft bed of moss or other plants, to see, whether, like the Wood Duck on such occasions, the Eider would suffer her young ones to fall from the nest; but unfortunately I had no opportunity of observing a case of this kind. The care which the mother takes of her young for two or three weeks, cannot be exceeded. She leads them gently in a close flock in shallow waters, where, by diving, they procure food, and at times, when the young are fatigued, and at some distance from the shore, she sinks her body in the water, and receives them on her back, where they remain several minutes. At the approach of their merciless enemy, the Black-backed Gull, the mother beats the water with her wings, as if intending to

raise the spray around her, and on her uttering a peculiar sound, the young dive in all directions, while she endeavours to entice the marauder to follow her, by feigning lameness, or she leaps out of the water and attacks her enemy, often so vigorously, that, exhausted and disappointed, he is glad to fly off, on which she alights near the rocks, among which she expects to find her brood, and calls them to her side. Now and then I saw two females which had formed an attachment to each other, as if for the purpose of more effectually contributing to the safety of their young, and it was very seldom that I saw these prudent mothers assailed by the Gull.

The young, at the age of one week, are of a dark mouse-colour, thickly covered with soft warm down. Their feet at this period are proportionally very large and strong. By the 20th of July they seemed to be all hatched. They grew rapidly, and when about a fortnight old were, with great difficulty, obtained, unless during stormy weather, when they at times retired from the sea to shelter themselves under the shelvings of the rocks at the head of shallow bays. It is by no means difficult to rear them, provided proper care be taken of them, and they soon become quite gentle and attached to the place set apart for them. A fisherman of Eastport, who carried eight or ten of them from Labrador, kept them several years in a yard close to the water of the bay, to which, after they were grown, they daily betook themselves, along with some common Ducks, regularly returning on shore towards evening. Several persons who had seen them, assured me that they were as gentle as their associates, and although not so active on land, were better swimmers, and moved more gracefully on the water. They were kept until the male birds acquired their perfect plumage and mated; but some gunners shot the greater number of them one winter day, having taken them for wild birds, although none of them could fly, they having been pinioned. I have no doubt that if this valuable bird were domesticated, it would prove a great acquisition, both on account of its feathers and down, and its flesh as an article of food. I am persuaded that very little attention would be necessary to effect this object. When in captivity, it feeds on different kinds of grain and moistened corn-meal, and its flesh becomes excellent. Indeed, the sterile females which we procured at Labrador in considerable number, tasted as well as the Mallard. The males were tougher and more fishy, so that we rarely ate of them, although the fishermen and settlers paid no regard to sex in this matter.

When the female Eider is suddenly discovered on her nest, she takes to wing at a single spring; but if she sees her enemy at some distance, she walks off a few steps, and then flies away. If unseen by a person coming near, as may often happen, when the nest is placed under the boughs of the dwarf fir, she will remain on it, although she may hear people talking. On

such occasions my party frequently discovered the nests by raising the pine branches, and were often as much startled as the Ducks themselves could be, as the latter instantly sprung past them on wing, uttering a harsh cry. Now and then some were seen to alight on the ground within fifteen or twenty yards, and walk as if lame and broken-winged, crawling slowly away, to entice their enemies to go in pursuit. Generally, however, they would fly to the sea, and remain there in a large flock until their unwelcome visiters departed. When pursued by a boat, with their brood around them, they allowed us to come up to shooting distance, when, feigning decrepitude, they would fly off, beating the water with partially extended wings, while the young either dived or ran on the surface with wonderful speed, for forty or fifty yards, then suddenly plunged, and seldom appeared at the surface unless for a moment. The mothers always flew away as soon as their brood dispersed, and then ended the chase. The cry or note of the female is a hoarse rolling croak; that of the male I never heard.

Should the females be robbed of their eggs, they immediately go off in search of mates, whether their previous ones or not I cannot tell, although I am inclined to think so. However this may be, the duck in such a case soon meets with a drake, and may be seen returning the same day with him to her nest. They swim, fly, and walk side by side, and by the end of ten or twelve days the male takes his leave, and rejoins his companions out at sea, while the female is found sitting on a new set of eggs, seldom, however, exceeding four. But this happens only at an early period of the season, for I observed that as soon as the males had begun to moult, the females whose nests had been plundered, abandoned the place. One of the most remarkable circumstances connected with these birds is, that the females with broods are fully three weeks later in moulting than the males, whereas those which do not breed begin to moult as early as they. This may probably seem strange, but I became quite satisfied of the fact while at Labrador, where, from the number which we procured in a state of change, and the vast quantities every now and then in sight, our opportunities of observing these birds in a perfectly natural state were ample.

Some authors have said that the males keep watch near the females; but, although this may be the case in countries such as Greenland and Iceland, where the Eiders have been trained into a state of semi-domestication, it certainly was not so in Labrador. Not a single male did we there see near the females after incubation had commenced, unless in the case mentioned above, when the latter had been deprived of their eggs. The males invariably kept aloof and in large flocks, sometimes of a hundred or more individuals, remaining out at sea over large banks with from seven to ten fathoms of water, and retiring at night to insular rocks. It seemed very

wonderful that in the long lines in which we saw them travelling, we did not on any occasion discover among them a young bird, or one not in its mature plumage. The young males, if they breed before they acquire their full colouring, must either be by themselves at this period, or with the barren females, which, as I have already said, separate from those that are breeding. I am inclined to believe that the old males commence their southward migration before the females or the young, as none were to be seen for about a fortnight before the latter started. In winter, when these Ducks are found on the Atlantic shores of the United States, the males and females are intermingled; and at the approach of spring, the mated pairs travel in great flocks, though disposed in lines, when you can distinctly see individuals of both sexes alternating.

The flight of the Eider is firm, strong, and generally steady. They propel themselves by constant beats of the wings, undulating their lines according to the inequality of surface produced by the waves, over which they pass at the height of a few yards, and rarely more than a mile from the shores. Few fly across the Gulf of St. Lawrence, as they prefer following the coasts of Nova Scotia and Newfoundland, to the eastern entrance of the straits of Belle Isle, beyond which many proceed farther north, while others ascend that channel and settle for the season along the shores of Labrador, as far up as Partridge Bay, and still farther up the St. Lawrence. Whilst on our waters, or at their breeding grounds, the Eiders are not unfrequently seen flying much higher than when travelling, but in that case they seem to be acting with the intention of guarding against their enemy man. The velocity of their flight has been ascertained to be about eighty miles in the hour.

This species dives with great agility, and can remain a considerable time under water, often going down in search of food to the depth of eight or ten fathoms, or even more. When wounded, however, they soon become fatigued in consequence of the exertion used in diving, and may be overtaken by a well-manned boat in the course of half an hour or so, as when fatigued they swim just below the surface, and may be struck dead with an oar or a boat-hook.

Their food consists principally of shell-fish, the shells of which they seem to have the power of breaking into pieces. In many individuals which I opened, I found the entrails almost filled with small fragments of shells mixed with other matter. Crustaceous animals and their roe, as well as that of various fishes, I also found in their stomach, along with pebbles sometimes as large as a hazel nut. The œsophagus, which is in form like a bag, and is of a leathery firm consistence, was often found distended with food, and usually emitted a very disagreeable fishy odour. The gizzard is ex-

tremely large and muscular. The trachea of the young male, so long as it remains in its imperfect plumage, or for the first twelve months, does not resemble that of the old male. The males do not obtain their full plumage until the fourth winter. They at first resemble the mother, then gradually become pie-bald, but not in less time than between two and three years.

The Eider Duck takes a heavy shot, and is more easily killed on wing than while swimming. When on shore they mark your approach while you are yet at a good distance, and fly before you come within shot. Sometimes you may surprise them while swimming below high rocks, and, if you are expert, then shoot them; but when they have first seen you, it is seldom that you can procure them, as they dive with extreme agility. While at Great Macatina Harbour, we discovered a large basin of water, communicating with the sea by a very narrow passage about thirty yards across, and observed that at particular stages of the tides the Eider Ducks entered and returned by it. By hiding ourselves on both sides of this channel, we succeeded in killing a good number, but rarely more than one at a shot, although sometimes we obtained from a single file as many as we had of gun-barrels.

Excepting in a single nest, I found no down clean, it having been in every other instance more or less mixed with small dry fir twigs and bits of grass. When cleaned, the down of a nest rarely exceeds an ounce in weight, although from its great elasticity, it is so bulky as to fill a hat, or if properly prepared even a larger space. The eggers of Labrador usually collect it in considerable quantity, but at the same time make such havoc among the birds, that at no very distant period the traffic must cease.

EIDER DUCK, *Anas mollissima*, Wils. Amer. Orn., vol. viii. p. 122.
FULIGULA MOLLISSIMA, Bonap. Syn., p. 389.
SOMATERIA MOLLISSIMA, *Eider*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 448
EIDER DUCK, Nutt. Man., vol. ii. p. 406.
EIDER DUCK, *Fuligula mollissima*, Aud. Orn. Biog., vol. iii. p. 344; vol. v. p. 611.

Male, 25, 42. Female, 24, 39.

Breeds in Maine, on the Bay of Fundy, in Labrador, Newfoundland, as far northward as travellers have proceeded. Common in winter from Nova Scotia to Massachusetts; rarely seen in New York.

Adult Male.

Bill about the length of the head, deeper than broad at the base, somewhat depressed towards the end, which is broad and rounded. Upper mandible with a soft tumid substance at the base, extending upon the forehead, and deeply divided into two narrow rounded lobes, its whole surface marked with divergent oblique lines, the dorsal outline nearly straight and sloping

to beyond the nostrils, then curved, the ridge broad at the base, broadly convex towards the end, the edges perpendicular, obtuse, with about fifty small lamellæ on the inner side, the unguis very large, elliptical. Nostrils sub-medial, oblong, large, pervious, nearer the ridge than the edge. Lower mandible flattened, with the angle very long, rather narrow and rounded, the dorsal line short and slightly convex, the edges with about sixty lamellæ, the unguis very broad, elliptical.

Head very large. Eyes of moderate size. Neck of moderate length, rather slender at its upper part. Body bulky and much depressed. Wings rather small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly having a series of scutella in its whole length, and a partial series above the fourth toe, the rest reticulated with angular scales. Hind toe small, with a free membrane beneath; anterior toes double the length of the tarsus, connected by reticulated membranes, having a sinus at their free margins, the inner with a broad lobed marginal membrane, the outer with a thickened edge; all obliquely scutellate above, the third and fourth about equal and longest. Claws small, that of first toe very small and curved, of middle toe largest, all rather depressed and blunt.

Plumage short, dense, soft, blended. Feathers on the fore part of the head extremely small; on the upper part very narrow, on the occiput and upper and lateral parts of the neck hair-like, stiff and glossy. Wings rather short, narrow, pointed; primary quills curved, strong, tapering, the first longest, the second scarcely shorter, the rest rapidly graduated; secondaries short, broad, rounded, the inner elongated, tapering, and recurved. Tail very short, much rounded, of sixteen narrow feathers.

Bill pale greyish-yellow, the unguis lighter, the soft tumid part pale flesh-colour. Iris brown. Feet dingy light green, the webs dusky. Upper part of the head bluish-black; the central part from the occiput to the middle white. The hair-like feathers on the upper part and sides of the neck are of a delicate pale green tint. The sides of the head, the throat, and the neck are white, the fore neck at its lower part of a fine colour intermediate between buff and cream-colour. The rest of the lower surface is brownish-black, as are the upper tail-coverts, and the central part of the rump. The rest of the back, the scapulars, smaller wing-coverts, and inner curved secondary quills, white, the scapulars tinged with yellow. Secondary coverts and outer secondaries brownish-black; primaries and tail-coverts greyish-brown.

Length to end of tail 25 inches, to end of wings 21½, to end of claws 27; extent of wings 42; wing from flexure 11¼; tail 4¼; bill from extremity of tumid part 2$\frac{11}{12}$, from its notch 2$\frac{7}{12}$, along the edge of lower mandible 2$\frac{9}{12}$;

tarsus 1¾ ; middle toe 2$\frac{1}{12}$, its claw $\frac{7}{12}$. Weight in winter, 5 lbs. 5½ oz. ; in breeding time 4 lbs. 8½ oz.

Adult Female.

The female differs greatly from the male. The bill is shorter, its tumid basal part much less and narrower. Feathers of the head and upper part of the neck are very small, soft, and uniform ; the scapulars and inner secondaries are not elongated, as in the male. Bill pale greyish-green ; iris and feet as in the male. The head and neck all round light brownish-red, with small lines of brownish-black. Lower part of neck all round, the whole upper surface, the sides, and the lower tail-coverts of the same colours, but there the brownish-black markings are broad. Secondary quills and larger coverts greyish-brown, tipped with white, primaries brownish-black ; tail-feathers greyish-brown. Breast and abdomen greyish-brown, obscurely mottled.

Length to end of tail 24 inches, to end of wings 20½, to end of claws 27 ; extent of wings 39 ; wing from flexure 11¼ ; tail 4 ; bill 3$\frac{7}{12}$; tarsus 1¾ ; middle toe 2$\frac{7}{12}$, its claw $\frac{5}{12}$. Weight in winter 4 lbs. 4½ oz. ; in breeding time 3 lbs. 12 oz.

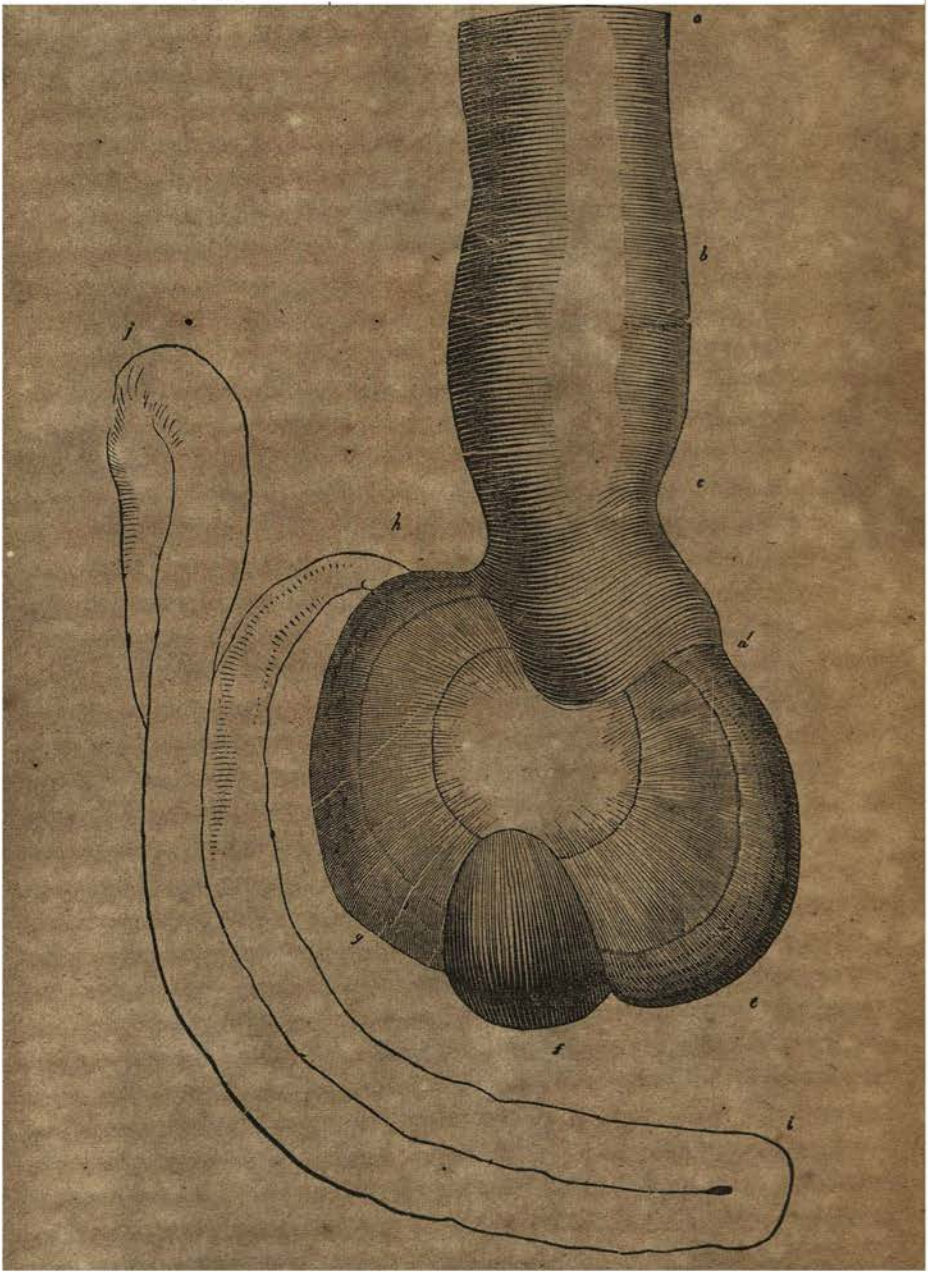
The down of the female is light grey ; that of the male on the white parts is pure white, on the dark, greyish-white.

I have represented three of these birds in a state of irritation. A mated pair, having a few eggs already laid, have been approached by a single male, and are in the act of driving off the intruder, who, to facilitate his retreat, is lashing his antagonists with his wings.

Adult Male, from Dr. T. M. Brewer. The roof of the mouth is broadly and deeply concave ; the posterior aperture of the nares linear, 10 twelfths long, margined with two rows of very pointed papillæ. Tongue 2 inches long, convex above, with a large median groove, fleshy, very thick, with a semicircular thin-edged horny tip ; the breadth at the base 4¾ twelfths, at the tip 4 twelfths ; the sides with two longitudinal series of bristles. The width of the mouth is 1 inch 3 twelfths. The œsophagus is 10½ inches long, for 4½ inches, its width is 1 inch, it then enlarges so as to form what might be considered as a kind of crop, 1 inch 7 twelfths in width ; after this it continues of the uniform diameter of 1 inch, but in the proventriculus, Fig. 1, *b c*, enlarges to 1¼ inches. Its muscular walls are very thick, and the external fibres conspicuous, the inner coat longitudinally plicate. The left lobe of the liver is 2 inches 2 twelfths long, the right lobe 4 inches. The gall-bladder elliptical, 1 inch 5 twelfths in length, 11 twelfths in breadth. The stomach, *c d e f g h*, is a gizzard of enormous size, placed obliquely, transversely elliptical, its length 2½ inches, its breadth 3 inches. The proventricular glands are extremely numerous, and form a belt 2 inches in

breadth. The left muscle of the stomach, *d e*, is 1¼ inches thick, the right, *g h*, 1 inch 2 twelfths; the epithelium very thick, and of a horny texture, with two elliptical convex grinding plates, of which the right is 2 inches in length, the left 1 inch 7 twelfths. Intestine 74 inches long; the width of

Fig. 1.



the duodenum, *h i j*, ½ inch, diminishing to 5 twelfths; the rectum, Fig. 2, *a b*, 7 twelfths in width; the cœca, *c c*, 3½ inches long, 4 inches distant from the extremity; their greatest width 4½ twelfths, for an inch at the base only 1 twelfth; the cloaca very slightly dilated, its breadth being only 8 twelfths.

The trachea is 9¼ inches long, nearly of the uniform width of 5 twelfths, moderately flattened; the rings 130, well ossified, ending in a transversely oblong dilatation, projecting more toward the left side, 1 inch in breadth, ½ inch in length. Bronchial half rings 32, the bronchi very wide, rings very narrow and cartilaginous. The contractor muscles are very large, and expanded over the whole anterior surface. At the distance of 1½ inches from the tympanum they give off the cleido-tracheal muscles, and at the tympanum itself the sterno-tracheal.

Fig. 2.

GOLDEN-EYE DUCK.

FULIGULA CLANGULA, *Linn.*

PLATE CCCCVI.—MALE AND FEMALE.

You have now before you another of our Ducks, which at least equals any of the rest in the extent of its migrations. Braving the blasts of the north, it visits the highest latitudes in spring, and returns at the approach of winter, spreading over the whole country, as if it seemed not to care in what region it spends its time, provided it find abundance of water. Now propelling itself gaily, it may be seen searching the pebbly or rocky bottom of the Ohio, or diving deep in the broad bays of Massachusetts or the Chesapeake. Presently it emerges with a cray-fish or a mussel held firmly in its bill. It shakes its head, and over its flattened back roll the large pearly drops of water, unable to penetrate the surface of its compact and oily plumage. The food is swallowed, and the bird, having already glanced around, suddenly plunges headlong. Happy being! Equally fitted for travelling through the air and the water, and not altogether denied the pleasure of walking on the shore; endowed with a cunning, too, which preserves you from many at least of the attempts of man to destroy you; and instinctively sagacious enough to place your eggs deep in the hollow of a tree, where they are secure from the nocturnal prowler, and, amid the down of your snowy breast, are fostered until the expected young come forth. Then with your own bill you carry your brood to the lake, where, under your tender care, they grow apace. The winged marauders, rapid as their flight may be, cannot injure you there; for while your young ones sink into the deep water, you arise on whistling wings, and, swifter than Jer Falcon, speed away.

In South Carolina the Golden-eye is abundant during winter, when it at times frequents the reserves of the rice-planters. I have also met with it on the water-courses of the Floridas at that season. From these countries westward and northward, it may be found in all parts of the Union where the waters are not frozen. It is seldom seen on small ponds entirely surrounded by trees, but prefers open places, and on the Ohio is generally found in the more rapid parts, on the eddies of which it dives for food.

This species exhibits a degree of cunning which surpasses that of many other Ducks, and yet at times it appears quite careless. When I have been

Golden Eye Duck

1 Male 2 Female

Drawn from Nature by J.J.Audubon F.R.S.F.L.S

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

walking, without any object in view, along the banks of the Ohio, between Shippingport and Louisville, I have often seen the Golden-eyes, fishing almost beneath me, when, although I had a gun, they would suffer me to approach within a hundred paces. But at other times, if I crawled or hid myself in any way while advancing towards them, with a wish to fire at them, they would, as if perfectly aware of my intentions, keep at a distance of fully two hundred yards. On the former occasion they would follow their avocations quite unconcernedly; while on the latter, one of the flock would remain above as if to give intimation of the least appearance of danger. If, in the first instance, I fired my gun at them, they would all dive with the celerity of lightning, but on emerging, would shake their wings as if in defiance. But if far away on the stream, when I fired at them, instead of diving, they would all at once stretch their necks, bend their bodies over the water, and paddle off with their broad webbed feet, until the air would resound with the smart whistling of their wings, and away they would speed, quite out of sight, up the river. In this part of the country, they are generally known by the name of "Whistlers."

I have observed that birds of this species rarely go to the shores to rest until late in the evening, and even then they retire to secluded rocks, slightly elevated above the surface, or to the margins of sand-bars, well protected by surrounding waters. In either case, it is extremely difficult for a man to get near them; but it is different with the sly racoon, which I have on several occasions surprised in the dawn, feeding on one which it had caught under night. Yet, on some of the bays of our sea-coasts, the Whistlers are easily enticed to alight by the coarsest representations of their figures in wooden floats, and are shot while they pass and repass over the place to assure themselves that what they see is actually a bird of their own kind. This mode is successfully followed in the bay and harbour of Boston in Massachusetts, as well as farther to the eastward.

The Golden-eye is rarely if ever seen in the company of any other species than those which are, like itself, expert divers; such, for example, as the Mergansers, or the Buffel-headed Duck; and it is very rare to see all the individuals of a flock immersed at once. Sometimes, when suddenly surprised, they immediately dive, and do not rise again until quite out of gunshot. When wounded, it is next to impossible to catch them: for their power of remaining under water is most surprising, and the sooner one gives up the chase the better.

The Golden-eye Ducks manifest a propensity to adhere to a place which they find productive, and that to a most extraordinary degree. One day while approaching the shallow fording-place of Canoe creek, near Henderson, in Kentucky, I observed five Whistlers fishing and swimming about.

They allowed me to advance to within a few yards of the shore, when, swimming close together, and shaking their necks, they emitted their rough croaking notes. Not being desirous of shooting them, I slapped my hands smartly together, when in an instant they all went down, but suddenly rose again, and running as it were over the water for about ten yards, took flight, passed and repassed several times over the ford, and alighted on the large branches of a sycamore that hung over the creek, at no greater distance from where I stood than about twenty yards. This was the first time in my life that I had seen Golden-eyes alight on a tree. I waded to the opposite side, and gazed upon them with amazement for several minutes. When on the eve of pursuing my course, one of them, gliding downwards with nearly closed wings, launched upon the water, and at once dived. The other four followed one after another, somewhat in the manner of Pigeons or Starlings, as if to ascertain whether some danger might not still exist. I left them at their avocations, and soon after met a family of country people going to Henderson, one of whom asked me respecting the depth of the ford, to which I replied that the water was low, and added that they should be careful lest some Ducks that I had left there might frighten the horses on which the women were. The good folks, with whom I was acquainted, laughed, and we parted.

About four o'clock, as I was returning, with a fine Turkey-cock slung to my back, I met the same party, who told me that, "sure enough," the Ducks were at the ford, and I was likely to have "a good crack at them." There they were when I went up, and I forced them to fly off; but as I was proceeding, and not more than fifty yards beyond the creek, I heard their splashings as they again alighted. In the course of a fortnight I visited the place several times, but never missed finding these five Ducks there. This led me to inquire as to the cause, and, having undressed, I waded out barefooted, and examined the bottom, which I found to be composed of rather hard blue clay, full of holes bored by cray-fish. But to make myself quite sure that these creatures formed the attraction to the Ducks, I watched an opportunity, and shot two of the latter, the examination of which satisfied me on the subject.

I had long before this been convinced, that an abundant supply of food afforded a powerful attraction to migrating birds, and on this subject you may remember my remarks in the articles of the Wild Turkey and Passenger Pigeon; but I had not then, nor have I since, seen so strong an instance of pertinacity in attachment to a particular spot.

The flight of this species is powerful, extremely rapid, and wonderfully protracted. It passes along with a speed equal to that of any of the Duck tribe, and I believe can easily traverse the space of ninety miles in an hour.

The whistling of its wings may be distinctly heard when it is more than half a mile distant. This statement may be found to be in contradiction to those of probably every previous writer, for it has been a general opinion, that the greater the extent of wing the more rapid is the flight, which is anything but correct. On flying from the water, they proceed for a considerable distance very low, not rising to any height until they have advanced several hundred yards.

The only nest of the Golden-eye which I have examined, I discovered, on the 15th of June, on the margin of a small creek about eight miles from Green Bay. The female left it, probably to go in search of food, whilst I was sitting under the tree in which it was, thinking more of my peculiar situation than of birds of any kind, for I was almost destitute of ammunition, and bent on returning to my family, then in Louisiana. How exciting are such moments to the ardent observer of Nature! In an instant, hunger, fatigue, even the thoughts of my beloved wife and children, vanished; and in a few minutes I was safely lodged on the tree, and thrusting my arm into the cavity of a large broken branch. Nine beautiful, greenish, smooth eggs, almost equally rounded at both ends, were at my disposal. They were laid on some dry grass of the kind that grew on the edges of the creek, and were deeply imbedded in the down of the bird. Not being then aware of the necessity of measuring or keeping eggs, I roasted them on some embers, and finding them truly delicious, soon satisfied my hunger. While I was eating them, the bird returned, but no male was to be seen. Whether many of these birds breed within the limits of the Union I cannot tell. Dr. RICHARDSON says they are abundant in the Fur Countries, and Mr. TOWNSEND states, that they are plentiful on the Rocky Mountains and along the north-west coast of America.

Of the changes which the young males undergo, nothing is known beyond the fact, that the young of both sexes resemble the adult female, until the approach of the first spring, when their general migration northward removes them from our observation.

At the approach of spring, I have observed this species swell the throat and the feathers of the head, and emit their rough croaking notes very frequently. The males at this period become very pugnacious, though, after all, they remove northward together, preceding the females for at least a fortnight. They usually spend the autumn and the earlier parts of winter separate from the females. These birds have, like the Goosanders, a habit of shaking their heads violently on emerging from the water. Their flesh is fishy, and in my opinion unfit for being eaten, unless in cases of excessive hunger. The food of this species, while on fresh water, consists of fish of various kinds, mollusca, young frogs, tadpoles, crayfish, and, I believe, some

kinds of grass. When on salt water, they feed principally on bivalves and fishes of different species.

GOLDEN-EYE, *Anas Clangula*, Wils. Amer. Orn., vol. viii. p. 62.

FULIGULA CLANGULÆ, Bonap. Syn., p. 393.

CLANGULA VULGARIS, *Common Golden-eye*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 456.

CLANGULA BARROVII, *Rocky-mountain Garrot*, Swains and Rich. F. Bor. Amer., vol. ii. p. 453.

COMMON GOLDEN-EYE, Nutt. Man., vol. ii. p. 441.

GOLDEN-EYE DUCK, *Fuligula Clangula*, Aud. Orn. Biog., vol. iv. p. 318; vol. v. p. 105.

Male, 20, 31½. Female, 16, 28.

Abundant during winter on all the running streams of the interior, as well as along the Atlantic coast, as far south as the Gulf of Mexico. Breeds in high northern latitudes. Accidental in the North-eastern Districts. Rocky Mountains and Columbia river.

Adult Male in winter.

Bill shorter than the head, deeper than broad at the base, gradually depressed toward the end, which is rounded. Upper mandible with the dorsal line straight and sloping to the middle, then slightly concave, and finally decurved; the ridge broad and rather concave at the base, narrowed between the nostrils, convex towards the end, the frontal angles long, the sides erect at the base, sloping and convex towards the end, the edges soft, with about fifty lamellæ, the unguis oblong and decurved. Nostrils medial, linear, pervious, nearer the ridge than the margin. Lower mandible flattened, ascending, nearly straight, a little curved at the base, the angle long, rather narrow, the dorsal line very slightly convex, the edges with about fifty lamellæ, the unguis broadly elliptical.

Head large, compressed. Eyes of moderate size. Neck short and thick. Body compact, much depressed. Feet very short, placed far back; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a few broad scales, the rest covered with reticular angular scales. Hind toe very small, with a broad free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, having a sinus on their free margins, the inner with a narrow, lobed, marginal membrane, the outer with a thickened edge, the third and fourth about equal and longest, all covered above with numerous narrow scutella. Claws small, slightly arched, compressed, obtuse, that of first toe very small, of third largest, and with an inner thin edge.

Plumage dense, soft and blended; feathers on the fore part of the head and cheeks very small and rounded, on the upper and hind parts, linear and elongated, as they also are on the lateral and hind parts of the upper neck, so

that when raised they give the head a very tumid appearance, which is the more marked that the feathers of the neck beneath are short. Wings small, decurved, pointed; the outer primaries pointed, the first generally longest, the second slightly shorter, in some specimens a little longer, the rest rapidly graduated; the secondaries incurved, obliquely rounded, the inner much elongated. Tail short, graduated, of sixteen feathers.

Bill black. Iris bright yellow. Feet orange-yellow, webs dusky, claws black. Head and upper part of neck deep green, changing to purple in certain lights. Back, posterior scapulars, inner secondaries, edge of wing, alula, primary coverts, primary quills, and four or five outer secondaries, black,—the back being darker and glossy, the wing-feathers tinged with brown. An elliptical patch between the base of the bill and the eye, lower part of neck all round, sides of the body anteriorly, the lower parts generally, the scapulars, excepting their margins, which are black, a large patch on the wing, including many of the smaller coverts, some of the secondary coverts, and six or seven of the secondary quills, pure white. The basal part of the secondary coverts black. Axillar feathers and lower wing-coverts dusky; the elongated feathers of the sides of the inner, some of them also their outer margins black, that colour in those of the innermost covering the whole inner web. The feathers on the legs, and along the sides of the rump, dusky. The tail brownish-grey.

Length to end of tail 20 inches, to end of wings 17½, to end of claws 20¼; extent of wings 31½; bill along the ridge 1⅜, from the angles 2, along the edge of lower mandible 2 1/12; wing from flexure 9; tail 4½; tarsus 1 5/12; hind toe 6/12, its claw 2/12; second toe 1 9/12, its claw 3/12; third toe, 2¼, its claw 4/12; fourth toe 2 4/12, its claw 3/12. Weight 2 lbs. 4½ oz.

Of another male, length to end of tail 19½, to end of claws 21½, to end of wings 17; extent of wings 31.

Adult Female.

The female is much smaller. Bill dusky, a portion at the end, not however including the unguis, dull yellowish-orange. Eyes and feet as in the male. Head and upper part of neck dull reddish-brown. Lower part of neck and the sides of the body brownish-grey, the feathers margined with pale grey. Upper parts greyish-brown, much darker behind; tail brownish-grey; wings brownish-black, seven of their coverts, excepting at the bases, white, the smaller coverts lighter and tipped with greyish-white; the legs and sides of the rump greyish-brown.

Length to end of tail 16 inches, to end of wings 15, to end of claws 17¼; extent of wings 28; wing from flexure 8½; tail 3¼; bill along the ridge 1⅜, from the angles 1⅝, along the lower mandible 1 5/8; tarsus 1 9/16; hind toe ⅝, its claw 1/8; middle toe 2 2/8, its claw ⅜; outer toe ⅛ longer; inner toe and claw ½. Weight 1¾ lbs.

WESTERN DUCK.

FULIGULA DISPAR, *Gmel.*

PLATE CCCCVII.—MALES.

This beautiful species, which was discovered by STELLER on the north-west coast of America, has never been known to visit our Atlantic shores. So very scarce indeed is it, that all my exertions to obtain a specimen have failed. It is surprising that it was not procured by any of the great navigators and travellers who have visited the northern and western coast within these fifteen years. As it has been acknowledged, however, as belonging to our Fauna, I have introduced a figure of it taken by my son JOHN WOODHOUSE, from a beautiful specimen in the Museum of Norwich, in England. It is said to have been shot at Yarmouth, in the county of Norfolk, in the winter of 1830.

ANAS DISPAR and ANAS STELLERI, Gmel. Syst. Nat., vol. i. p. 535, 518.
FULIGULA STELLERI, Bonap. Syn., p. 394.
WESTERN DUCK, *Fuligula dispar*, Aud. Orn. Biog., vol. v. p. 253.

Male, 16; wing, 8¼.
North-west coast.
Adult Male.

Bill shorter than the head, deeper than broad at the base, depressed towards the end, which is rounded. Upper mandible with the dorsal line straight and sloping in the middle, then slightly concave, at the end decurved; the ridge broad and flat at the base, afterwards convex, as are the sides, the unguis elliptical. Nostrils sub-basal, oblong. Lower mandible flat, with the angle long and rather narrow, the unguis elliptical.

Head large, compressed; neck rather short and thick. Feet short, stout, placed rather far behind; tarsus very short, compressed, reticulate with a series of larger scales in front. Hind toe small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, the inner with a narrow lobed marginal membrane; the third longest, the fourth nearly equal; all covered above with numerous short scutella. Claws small, arched, obtuse.

Plumage dense, soft, blended. Wings of moderate length, pointed; the

Western Duck.

Males.

Drawn from Nature by J.J.Audubon FRSFLS.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

Buffel headed Duck

Drawn from Nature by J.J.Audubon, F.R.S.F.L.S.

1. Male 2. Female.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

first quill longest; secondaries short, broad, rounded, the inner elongated, lanceolate, and decurved, as are the scapulars. Tail rather short, pointed, of fourteen feathers.

Bill dull greyish-blue, as are the feet, the claws yellowish-grey. The upper part of the head and a broad band surrounding the neck are white; the throat; some feathers around the eye are black; a light green patch in the loral space, and a transverse patch of the same on the nape, margined behind and laterally with black. A broad band on the neck and the whole of the back is velvet-black, with green reflections; the smaller wing-coverts white; the secondary coverts bluish-black, terminating in a broad white band; the elongated secondaries and scapulars with the inner web white, the outer black, with blue reflections; the primaries and coverts brownish-black, the tail black, as are the lower tail-coverts and abdomen; the rest of the lower parts deep reddish-buff, fading toward the shoulders and neck into pure white; there is a bluish-black spot on each side of the lower part of the neck anterior to the wing.

Length to end of tail 16 inches; bill along the ridge $\frac{9}{12}$; wing from flexure $8\frac{3}{8}$; tail 4; tarsus $1\frac{3}{16}$; inner toe and claw $1\frac{1}{2}$; middle toe and claw $2\frac{1}{8}$; outer toe and claw $2\frac{1}{4}$; breadth of ungnis of upper mandible $\frac{3}{8}$; breadth of bill at base $\frac{5}{8}$.

BUFFEL-HEADED DUCK.

FULIGULA ALBEOLA, *Linn.*

PLATE CCCCVIII.—MALE AND FEMALE.

There are no portions of the Union on the waters of which this beautiful miniature of the Golden-eye Duck is not to be found, either during the autumnal months or in winter; and, therefore, to point out any particular district as more or less favoured by its transient visits would be useless. The miller's dam is ornamented by its presence; the secluded creeks of the Middle States are equally favoured by it as the stagnant bayous and lakes of Lower Louisiana; in the Carolinas and on the Ohio, it is not less frequent; it being known in these different districts by the names of Spirit Duck,

Butter-box, Marrionette, Dipper, and Die-dipper. It generally returns from the far north, where it is said to breed, about the beginning of September, and many reach the neighbourhood of New Orleans by the middle of October, at which period I have also observed them in the Floridas. Their departure from these different portions of our country varies from the beginning of March to the end of May. On the 11th of that month in 1833, I shot some of them near Eastport in Maine. None of them have, I believe, been found breeding within the limits of the Union. During the period of their movements towards the north, I found them exceedingly abundant on the waters of the Bay of Fundy, the males in flocks, and in full dress, preceding the females about a fortnight, as is the case with many other birds.

The Marrionette—and I think the name a pretty one—is a very hardy bird, for it remains at times during extremely cold weather on the Ohio, when it is thickly covered with floating ice, among which it is seen diving almost constantly in search of food. When the river is frozen over, they seek the head waters of the rapid streams, in the turbulent eddies of which they find abundance of food. Possessed of a feeling of security arising from the rapidity with which they can dive, they often allow you to go quite near them, though they will then watch every motion, and at the snap of your gun, or on its being discharged, disappear with the swiftness of thought, and perhaps as quickly rise again, within a few yards, as if to ascertain the cause of their alarm. I have sometimes been much amused to see the apparent glee with which these little Dippers would thus dive at the repeated snappings of a miserable flint lock, patiently tried by some vagrant boys, who, becoming fatigued with the ill luck of their piece, would lay it aside, and throw stones at the birds, which would appear quite pleased.

Their flight is as rapid as that of our Hooded Merganser, for they pass through the air by regularly repeated beats of their wings, with surprising speed; and yet this is the best time for the experienced sportsman to shoot them, as they usually fly low. Their note is a mere croak, much resembling that of the Golden-eye, but feebler. At the approach of spring, the males often swell their throats and expand the feathers of the head, whilst they utter these sounds, and whilst moving with great pomposity over the waters. Often too, they charge against each other, as if about to engage in combat, but I have never seen them actually fighting.

When these birds return to us from the north, the number of the young so very much exceeds that of the old, that to find males in full plumage is much more uncommon than toward the time of their departure, when I have thought the males as numerous as the females. Although at times they are very fat, their flesh is fishy and disagreeable. Many of them, however, are offered for sale in our markets. I have often found some of them on

inland ponds, which they seemed loth to leave, for, although repeatedly shot at, they would return. Their food is much varied according to situation. On the sea-coast, or in estuaries, they dive after shrimps, small fry, and bivalve shells; and in fresh water, they feed on small crayfish, leeches, and snails, and even grasses.

Not having found any of these birds in Labrador or Newfoundland, I am unable to say anything as to their nests. Dr. RICHARDSON states, that they frequent the rivers and fresh-water lakes throughout the Fur Countries in great numbers, but does not mention having observed them breeding. As in almost all other species of this family, the young of both sexes in autumn resemble the adult female. Mr. TOWNSEND has found this species on the streams of the Rocky Mountains, and it has been observed as far westward as Monterey in New California.

BUFFEL-HEADED DUCK, *Anas albeola*, Wils. Amer. Orn., vol. viii. p. 51.
FULIGULA ALBEOLA, Bonap. Syn., p. 394.
CLANGULA ALBEOLA, *Spirit Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 458
SPIRIT DUCK, Nutt. Man., vol. ii. p. 445.
BUFFEL-HEADED DUCK, *Fuligula albeola*, Aud. Orn. Biog., vol. iv. p. 217.

Male, 14½, 23. Female, 13, 22½.

Distributed throughout the country and along the Atlantic shores during autumn, winter, and spring. Texas, Upper California, Columbia river. Breeds very far north.

Adult Male.

Bill much shorter than the head, comparatively narrow, deeper than broad at the base, gradually depressed towards the end, which is rounded. Upper mandible with the dorsal line straight and sloping to the middle, then nearly straight, at the end decurved; the ridge broad and flat at the base, narrowed between the nostrils, convex towards the end, the sides convex, the edges soft, with about thirty-five lamellæ, the unguis oblong. Nostrils sub-medial, linear, pervious, nearer the ridge than the margin. Lower mandible flat, ascending, curved at the base, the angle long, rather narrow, the dorsal line very slightly convex, the edges with about forty lamellæ, the unguis broadly elliptical.

Head rather large, compressed. Eyes of moderate size. Neck short and thick. Body compact, depressed. Feet very short, placed far back, tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a few broad scales, the rest covered with reticular angular scales. Hind toe very small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, having a sinus on their free margins, the inner with a narrow lobed

marginal membrane, the outer with a thickened edge, the third and fourth about equal and longest, all covered above with numerous narrow scutella. Claws small, slightly arched, obtuse, that of first toe very small, of third largest, and with an inner thin edge.

Plumage dense, soft, and blended. Feathers on the fore part of the head very small and rounded, on the upper and hind parts linear and elongated, as they also are on the lateral and hind parts of the upper neck, so that when raised, they give the head an extremely tumid appearance, which is the more marked that the feathers of the neck immediately beneath are short. Wings very small, decurved, pointed; the outer primaries pointed, the first longest, the rest rapidly graduated; the secondaries incurved, obliquely rounded, the inner much elongated and acuminate. Tail short, graduated, of sixteen feathers.

Bill light greyish-blue. Iris hazel. Feet very pale flesh-colour, claws brownish-black. Fore part of the head of a deep rich green, upper part rich bluish-purple, of which colour also are the elongated feathers on the fore part and sides of the neck, the hind part of the latter deep green; a broad band of pure white from one cheek to the other over the occiput. The coloured parts of the head and neck are splendent and changeable. The rest of the neck, the lower parts, the outer scapulars, and a large patch on the wing, including the greater part of the smaller coverts and some of the secondary coverts and quills, pure white, the scapulars narrowly margined with black, as are the inner lateral feathers. Axillary feathers brownish-black, some of them white on the margins and towards the end; lower wing-coverts brownish-black, the smaller tipped with white. The back, inner scapulars, and inner secondary quills, velvet-black. The feathers on the anterior edge of the wing are black, narrowly edged with white; alula, primary coverts, and primary quills, deep black. The feathers on the rump gradually fade into greyish-white, and those of the tail are brownish-grey, with the edges paler, and the shafts dusky.

Length to end of tail 14½ inches, to end of wings 13¾, to end of claws 15¾; extent of wings 23; wing from flexure 6¾; tail 3½; bill along the ridge 1 2/12, along the edge of lower mandible 1 1/12; tarsus 1 3/12, hind toe and claw 1 8/12; outer toe 2 1/12, its claw 2/12; middle toe 2, its claw 3/12; inner toe and claw 1 9/12. Weight 1 lb.

Adult Female.

The female is much smaller. The plumage of the head is not elongated as in the male, but there is a ridge of longish feathers down the occiput and nape. Bill darker than that of the male; feet greyish-blue, with the webs dusky. Head, upper part of neck, hind neck, back and wings, greyish-brown; a short transverse white band from beneath the eye, and a slight

speck of the same on the lower eyelid. Six of the secondary quills white on the outer web. Lower parts white, shaded into light greyish-brown on the sides; tail dull greyish-brown.

Length to end of tail 13 inches, to end of claws 13¼, to end of wings 11½; extent of wings 22¼. Weight 8 oz.

Individuals of both sexes differ much in size, and in the tints of their plumage.

In an adult male, the tongue is 1 inch and 2 twelfths long, fleshy, and of the same general form as in the other Ducks already described. The œsophagus is 6¾ inches long, passes along the right side, has a diameter at the top of 4½ twelfths, enlarges about the middle to 9 twelfths, and contracts to ½ inch as it enters the thorax. The proventriculus is 1 inch long, 8 twelfths in its greatest diameter, its glandules, which are of moderate size, forming a complete belt, as in all other Ducks. The stomach is a muscular gizzard of a roundish form, 1 inch 5 twelfths long, 1 inch 4 twelfths in breadth; its lateral muscles 5 twelfths in thickness; its epithelium tough, hard, and slightly rugous. The intestine is 3 feet 11 inches long; its average diameter 3 twelfths, its walls thick, and its inner surface villous. The rectum is 3 inches long; the cœca 2¼ inches in length, their diameter at the commencement 1 twelfth, towards the end 2 twelfths.

The trachea is 5 inches long, much flattened, its rings unossified, its diameter at the top 2¾ twelfths, towards the lower part 3 twelfths, having scarcely any appearance of dilatation at the part which is so excessively enlarged in the Golden-eyed Duck, which in form and habits is yet very closely allied. The lateral muscles are strong, and there are cleido-tracheal and sterno-tracheal muscles, as in other Ducks.

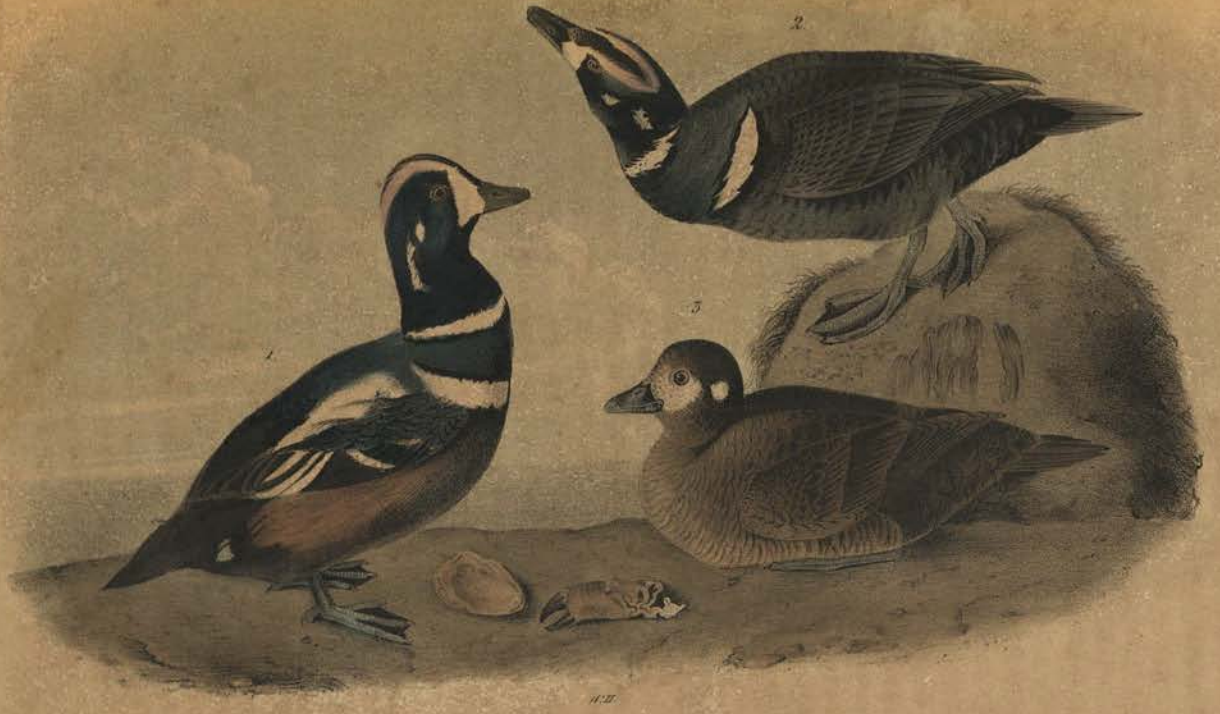
THE HARLEQUIN DUCK.

FULIGULA HISTRIONICA, *Linn.*

PLATE CCCCIX.—MALE, FEMALE, AND YOUNG.

I have the pleasure of presenting you with three figures of the Harlequin Duck, one a male in all the perfection of its spring plumage, the bird having attained complete maturity, another male two years old, and an adult female shot in the pairing season. No figures of the adult male or of the female have, I believe, hitherto been published.

To the south of the Bay of Boston the "Lord and Lady Duck" is rarely seen on our coast; but from that neighbourhood it becomes more plentiful as you proceed eastward; and, on reaching Maine and the entrance of the Bay of Fundy, you may see it at any period of the year among the rocky islands there. It breeds on the Seal, White Head, and Grand Manan Islands, and along the coast of Nova Scotia, Cape Breton, Newfoundland, and Labrador. Many, however, proceed much farther north, for specimens were obtained by Captain JAMES CLARK ROSS in the highest latitudes visited by him. It is extremely attached to certain localities, from which it rarely wanders unless greatly molested, and it thus remains about the islands, or the parts of the coast on which it breeds, unless it be forced off by very severe weather in winter. Few persons shoot it for its flesh; not that it is inferior as food to other deep-diving Ducks, but because it is comparatively small, and difficult to be obtained. Not only is it all seasons remarkably shy and vigilant, but even if approached when on rocks, it plunges into the water the moment its keen eye catches a glance of you, dives with all the agility of the Black Guillemot, and seldom rises within shot. If you shoot at it when passing on wing, even should it be beyond reach, it plunges into the water the moment it perceives the flash,—a habit which is also occasionally observed in the Black Guillemot. It being usually found in flocks of one or two families, or of from twelve to fifteen individuals, some one always acts as a watchful sentinel, whose single note of alarm is sufficient to induce the whole to move off without hesitation. Notwithstanding all this vigilance, however, my party procured a good number of them at different times, by lying in wait for them under cover of some rocks, in the neighbourhood of which they were known to alight at certain hours of the day,



Harlequin Duck.

1 old Male. 2. Female 3 Young Male.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.ed Printed & Col.d by J. T. Bowen. Philad.a

to bask in the sun and dress their plumage. On these occasions a shot seldom failed to kill several, for they fly compactly and alight close together.

On the 31st of May, 1833, I found them breeding on White Head Island, and other much smaller places of a similar nature, in the same part of the Bay of Fundy. There they place their nests under the bushes or amid the grass, at the distance of twenty or thirty yards from the water. Farther north, in Newfoundland and Labrador, for example, they remove from the sea, and betake themselves to small lakes a mile or so in the interior, on the margins of which they form their nests beneath the bushes next to the water.

The nest is composed of dry plants of various kinds, arranged in a circular manner to the height of two or three inches, and lined with finer grasses. The eggs are five or six, rarely more, measure two inches and one-sixteenth by one inch and four and a half eighths, and are of a plain greenish-yellow colour. These measurements differ a little from those of an egg sent to me by my friend Mr. HEWITSON of Newcastle-upon-Tyne, and which had been found in Ireland by Mr. ATKINSON. After the eggs are laid, the female plucks the down from the lower parts of her body, and places it beneath and around them, in the same manner as the Eider Duck and other species of this tribe. The male leaves her to perform the arduous but, no doubt to her, pleasant task of hatching and rearing the brood, and, joining his idle companions, returns to the sea-shore, where he moults in July and August, The little ones leave the nest a few hours after they burst the shell, and follow their mother to the water, where she leads them about with the greatest care and anxiety. When about a week old she walks with them to the sea, where they continue, in the same manner as the Eiders. When discovered in one of these small inland lakes, the mother emits a lisping note of admonition, on which she and the young dive at once, and the latter make for the shores, where they conceal themselves, while the former rises at a good distance, and immediately taking to wing, leaves the place for awhile. On searching along the shores for the young, we observed, that on being approached, they ran to the water and dived towards the opposite side, continuing their endeavours thus to escape, until so fatigued that we caught four out of six. When at sea, they are as difficult to be caught as the young Eiders.

The flight of the Harlequin Duck is rapid and generally straight. At sea it flies at a small height, but when flying over the land, or even when approaching it, should there be any suspicion of danger, it rises to a considerable height. Its food consists of shrimps, small fishes, roe, aquatic insects, and mollusca, which it procures by diving. The flesh is dark, and

generally tastes of fish, but that of the female is good during the period of her sojourn on the fresh-water ponds.

The male takes three years to acquire his full plumage, although many individuals breed in the second year. The female is perfect in the second spring. Dr. RICHARDSON, in the Fauna Boreali-Americana, describes a male killed on the eastern declivity of the Rocky Mountains, whence it appears that at times it goes far inland; and it is very probable that its habits differ greatly in different localities.

HARLEQUIN DUCK, *Anas histrionica*, Wils. Amer. Orn., vol. viii. p. 139.

FULIGULA HISTRIONICA, Bonap. Syn., p. 394.

CLANGULA HISTRIONICA, *Harlequin Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 459.

HARLEQUIN DUCK, *Fuligula histrionica*, Aud. Orn. Biog., vol. iii. p. 612; vol. v. p. 617.

Adult Male in summer.

Bill much shorter than the head, comparatively narrow, deeper than broad at the base, slightly depressed towards the end, which is rounded. Upper mandible with the dorsal line straight and sloping to the middle, then nearly straight, towards the tip decurved, the ridge broad and flat at the base, convex towards the end, the sides convex, the edges soft, with about thirty-five oblique internal lamellæ, the unguis large and elliptical. Nostrils sub-basal, elliptical, very large, pervious, nearer the ridge than the edge. Lower mandible flat, with the angle long, rather narrow, rounded, the dorsal line slightly convex, the edges with about forty lamellæ, the unguis elliptical.

Head rather large, compressed. Eyes of moderate size. Neck of ordinary length, thick. Body large, depressed. Wings rather small. Feet very short, placed rather far behind; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a few broad scales, the rest covered with reticular angular scales. Hind toe very small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, having a sinus on their free margins, the inner with a narrow lobed marginal membrane, the outer with a thickened edge, the third and fourth about equal and longest, all covered above with narrow scutella. Claws small, arched, obtuse, that of first toe very small, of third largest, and with an inner thin edge.

Plumage dense, soft, blended. Feathers on the fore part of the head very small and rounded, on the upper part of the head slightly elongated, on the neck narrow, on the other parts broad and rounded. Wings rather short, narrow, pointed; primary quills curved, strong, tapering, and pointed, the first and second about equal, and longest, the rest rapidly graduated; secon-

dary short, broad, and rounded. Tail very short, cuneate, of sixteen strong tapering feathers.

Bill light yellowish-olive, the tips of the unguis lighter. Iris reddish-brown. Feet light blue, the webs greyish-black, the claws whitish. A broad band from the base of the bill to the occiput bluish-black, margined behind with light yellowish-red, before with white, that colour forming a broad triangular spot on the cheek anterior to the eye. Sides of the head, and neck all round, purplish-blue; a spot of white behind the ear, a curved line on the side of the neck, a complete ring of white below the middle of the neck, with a curved band of the same colour anterior to the wing. All these white markings broadly edged with deep black. The fore part of the back light purplish-blue, the hind part gradually deepening in tint, so as to become almost black, of which colour is the rump all round. Scapulars chiefly white; wing-coverts purplish-blue, as are the alula and primary coverts, the quills dark greyish-brown, the tail greyish-black, a small white spot near the flexure of the wing; a band of white across the wing, formed by the tips of the secondaries of which the inner have their outer webs principally of the same colour. Fore part of the breast purplish-blue, hind part and abdomen greyish-brown, sides light red; a lateral spot of white near the root of the tail.

Length to end of tail 17¼ inches, to end of wings 14½, to end of claws 16½; extent of wings 26½; wing from flexure 7¾; tail 3¼; bill along the back 1$\frac{1}{16}$, along the edge of lower mandible 1½; tarsus 1$\frac{5}{16}$; middle toe 2, its claw $\frac{5}{16}$. Weight 1½ lbs.

Male in the second year.

The young male, after the first moult, is greyish-brown on the back and wings, light brownish-grey beneath. The head and neck are of a dull leaden-blue, the upper part of the head darker. The white spot before the eye is mottled with grey, the line extending over the eye obscure, and the edging of the occiput faint reddish-brown. The two white marks exist on the sides of the neck, but are merely edged with darker blue; there are slight indications of the white collar, and the band before the wing is marked, but much smaller than in the adult. The quills are dark brown, but the secondaries are not tipped with white, of which there are but slight indications on the scapulars. The upper tail-coverts are blackish, the tail bluish-grey, lighter at the end. The bill is dusky, the feet of a leaden tint.

Male in the third year.

After the second moult, the male has greatly improved in colouring, although the tints are not nearly so pure as in the old bird. The hind part of the back is still brown, as are the wing-coverts; the sides are dark brownish-grey, with undulated yellowish-red bars. The white collar is not yet

complete, but all the white markings on the neck are edged with black; the fore part of the breast is dull grey, the middle yellowish-grey, spotted with bluish-grey. The white bar on the wing is still wanting; the rump is glossy bluish-black, the tail nearly of the same tint.

Adult Female.

The principal colour of the female is greyish-brown, deeper on the head and rump, lighter on the fore neck, and mottled with greyish-white on the breast. The quills are dark brown, edged with lighter, the tail blackish-grey. There is a large whitish spot mottled with grey before the eye, and another of a purer white behind the ear. Bill and feet dull bluish-grey. Iris brown.

Length to end of tail 16 inches, to end of wings 13¾, to end of claws 15½; extent of wings 24½; wings from flexure 8¾; tail 3½; bill along the back 1$\frac{1}{16}$, along the edge of lower mandible 1½; tarsus 1¼; middle toe 2, its claw $\frac{4}{12}$. Weight 1¾ lbs.

Male from Dr. T. M. Brewer. Width of mouth 9 twelfths, its roof deeply concave as in most other Ducks; the posterior aperture of the nares oblongo-linear, 8 twelfths in length, margined with very slender acute papillæ; the lamellæ on each side of the upper mandible about 35; those on the edge of the lower mandible about 60; the tongue 1 inch 4 twelfths long, fleshy, broad, thick at the base, becoming thin toward the end, with thin, fringed margins, and a semicircular tip. Œsophagus 7 inches 2 twelfths long, of the uniform width of 8 twelfths on the neck, the proventriculus 9 twelfths in breadth. Stomach a strong muscular gizzard, 1½ inches long, 1 inch 7 twelfths broad; the lateral muscles very large, the tendons covering almost its whole surface; the epithelium very thick, dense, with two opposite elliptical flat grinding surfaces. The proventricular glands form a belt 1½ inches in breadth. The liver is very large, its lobes very unequal, the right 2 inches 8 twelfths long, the left 1 inch 8 twelfths. Intestine 58½ inches long, its average width 5 twelfths.

The trachea, which is 6½ inches in length, has at first a breadth of only 3 twelfths, but at the distance of three-quarters of an inch enlarges to 4½ twelfths, and so continues for 2 inches; it then contracts to 2½ twelfths, and again at the lower part enlarges to 5¼ twelfths, and terminates in a large transverse bony dilatation or tympanum, of which the length is 7½ twelfths, the breadth 1 inch 2 twelfths; it projects as usual to the left side, where it is of a rounded form. The rings of the trachea are 124, broad, firm, and well ossified. The bronchi are of moderate width, of about 25 half rings. The lateral muscles are strong, the sterno-tracheal of considerable size, coming off at the commencement of the tympanum, and there are no inferior laryngeal muscles.

Long-tailed Duck

1. Male. Summer Plumage, 2 Male in Winter 3 Female and Young

Drawn from Nature by J. J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen Phila.a

In a female, the intestine is 57 inches long; its width in the duodenal part 3 twelfths; the cœca 4 inches long, 3 twelfths in breadth at the widest part, at the base 1 twelfth, and toward the end 2 twelfths; their distance from the extremity 3 inches.

LONG-TAILED DUCK.

FULIGULA GLACIALIS, *Linn.*

PLATE CCCCX.—MALES, FEMALE, AND UNFLEDGED YOUNG.

In the course of one of my rambles along the borders of a large fresh-water lake, near Bras-d'or, in Labrador, on the 28th of July, 1833, I was delighted by the sight of several young broods of this species of Duck, all carefully attended to by their anxious and watchful mothers. Not a male bird was on the lake, which was fully two miles distant from the sea, and I concluded that in this species, as in many others, the males abandon the females after incubation has commenced. I watched their motions a good while, searching at the same time for the nests, one of which I was not long in discovering. Although it was quite destitute of anything bearing the appearance of life, it still contained the down which the mother had plucked from herself for the purpose of keeping her eggs warm. It was placed under an alder bush, among rank weeds, not more than eight or nine feet from the edge of the water, and was formed of rather coarse grass, with an upper layer of finer weeds, which were neatly arranged, while the down filled the bottom of the cavity, now apparently flattened by the long sitting of the bird. The number of young broods in sight induced me to search for more nests, and in about an hour I discovered six more, in one of which I was delighted to find two rotten eggs. They measured 2 inches and ⅛ long, by 1⅛ broad, were of a uniform pale yellowish-green, and quite smooth.

My young companions had, unfortunately for me, walked that morning to Blanc Sablon, about thirty miles distant, down the Straits of Belle Isle; and having no dog to assist me in procuring some of the Young Ducks, I was obliged to enact the part of one myself, although the thermometer that day was 45° 50′, and the atmosphere felt chilly. I gave chase to the younglings, which made for different parts of the shore, as I followed them up to my

middle in the water, while they dived before me like so many Water-witches, the mothers keeping aloof, and sounding their notes of alarm and admonition. I was fortunate enough to procure several of the young birds, and afterwards shot one of the old, which having young much smaller than the rest, was more anxious for their safety, and kept with them within shot. She and the young were afterwards put in rum, to be subsequently examined. I counted eleven broods on the same pond, and Mr. JONES assured me that these birds always breed in numbers together, but rarely on the same lake two successive years. Their plumage was ragged, in so far as I could judge, and the individual which I shot was similar. They never dived while in my sight, but seemed constantly to urge their young to do so, and the little things so profited by the advice of their parents, that had they remained in the water, instead of making, after awhile, for the land, I believe I should not have succeeded, after all my exertions, in capturing a single one of them.

The gentleman above mentioned informed me that the old birds keep the young in the ponds until they are quite able to fly, or until the end of August, when the flocks remove on wing to the sea, and soon after leave the coast, seldom reappearing before the first days of May, or about two weeks before most other kinds of Ducks. The little ones which I procured, were as you see them represented in my plate. Those that were larger were of the same colour, and none showed any feathers on their bodies. Now and then, like all other young Ducks, they would skim over the surface of the water with astonishing rapidity, emitting a sharp note somewhat resembling the syllables *pee, pee, pee,* and would then dive with the quickness of thought. When squatted among the moss, they allowed me to take them without making any attempt to escape. The young were put in a tub, and had some soaked biscuit placed near them; but they were all found dead the next morning.

The range of this noisy, lively, and beautiful Duck, extends along our coast as far south as Texas, and it is also found at the mouth of the Columbia river; but the species is never found on any of our fresh-water courses, and I am quite confident that Mr. SAY mistook for it the Pintail Duck, *Anas acuta*, when he says that he found it on the waters of the Missouri. During all my residence in the neighbourhood of the Mississippi, and in the course of all my journeys on and along its waters, I never saw one of these birds, or heard of any having occurred on that stream above its confluence with the Gulf of Mexico; whereas the Pintails are extremely abundant there, as well as on the Missouri, the Ohio, and all our western streams, in spring and autumn. Few Long-tailed Ducks are to be seen in the market of New

Orleans, and in fact they are altogether what our gunners usually call "sea ducks."

The period of the first appearance of this species in autumn depends much on the state of the weather. I have known a difference of a whole month in the Sound, and quite as much in Chesapeake Bay, in both of which it is most abundant in winter, rarely proceeding farther south until driven away by extreme cold. Their advance from Labrador and Newfoundland along the coast, until they reach Long Island, is more hurried than afterwards. They arrive in small flocks, which are soon joined by others, and as they are prone to congregate, vast numbers are seen together in winter, when their cacklings, though different from those of our frogs in spring, are almost as incessant from sunset until dawn. For my part, I have never perceived any resemblance which their notes bear to the words "south-southerly," but think their noisy cries as duckish as those of the Mallard, although sharper and more musical. The best imitation is given by my friend NUTTALL, but if you attempt to reduce the syllables to sounds, there is some probability of your at least succeeding in exciting laughter in yourself or others. He says the notes are "ogh, ough, egh," and again "ogh, ogh, ogh, ough, egh," and adds that they are guttural, and have a ludicrous drawling tone. Dr. RICHARDSON informs us that "the peculiar cry of this Duck is celebrated in the songs of the Canadian voyagers." This to my mind would imply that the Long-tailed Ducks are seen by these adventurous travellers on the waters of the inland streams, which would appear to be at variance with their usual habits, for unless during the breeding season, they give a decided preference to the sea; and indeed generally keep in deep water. Owing to their reiterated cries these birds are named "Noisy Ducks;" but they have various appellations, among others those of "Old Wives," and "Old Squaws."

Although, like all sea-ducks, the "Old Wife" swims deeply, it moves with a grace and celerity, which, if not superior to those of any of its tribe, are at least equal; and when the weather is rough, and the waters agitated, it raises its tail in the same manner as the Ruddy Duck and Pintail. When advancing in smooth water, its speed is such as to cause a considerable swell before it, such as sea-faring persons usually call a "bone." Like all others of its tribe, it also prefers swimming against both wind and tide, as then it can sooner take wing if necessary. In calm and pleasant weather, like its congeners, it is fond of throwing its body almost over, and of pluming itself in that position. When on wing, the long feathers of its tail do not seem to aid its progress, any more than in other species.

It seldom removes from the north on its way to our Middle Districts in large flocks; but at the approach of the breeding season, and after the birds

appear to be all paired, they fly northward in long lines, or broad fronts, moving high or low according to the state of the weather, passing at times at a considerable distance from the shores, but flying close to the points of every cape, although they never pass over an isthmus, however narrow. Their flight is swift, well sustained, and accompanied with a well-marked whistling of their wings. Being expert divers, it is difficult to kill them on the water; and if you happen to wound one but slightly, I would advise you, reader, to give up the chase, unless you have hit it while on the ice, in which case you will find that it runs rather awkwardly. Their flesh is none of the best, being dark, generally tough, and to the taste fishy; for which reason they are now-a-days frequently brought to our markets plucked, with the head and feet cut off, and called by the venders by all names excepting old wives, squaws, noisy ducks, or south-southerlies. The food of this species consists chiefly of shell-fish; but in the stomachs of those killed on fresh water in Labrador, I found small fishes, and a quantity of grass and its roots.

From the great number of specimens which I have procured in our Middle Districts in winter, and those which I have seen killed during the love season in the north, I am induced to think that the elongated feathers of the tail of this species scarcely, if at all, differ in length at these different periods, although some writers have said that in spring they are much longer than in winter, in which latter season, however, I think the old males differ only in the colour of their plumage from their state in spring. I have obtained male specimens at New York and at Baltimore early in March, when they were already much changed from their appearance in winter; but my friend BACHMAN informs me that he has never seen one with any appearance of the summer plumage at Charleston in South Carolina, where, however, he adds, this species is not common.

I have represented two male birds, one in its full spring dress, the other in that of winter. You will also find in the same plate the first figure ever given of an adult female, accompanied with as many younglings as I could conveniently introduce. WILSON gave the figure of a young male in the first winter as that of a female.

LONG-TAILED DUCK, *Anas glacialis*, Wils. Amer. Orn., vol. viii. p. 93.

FULIGULA GLACIALIS, Bonap. Syn., p. 395.

LONG-TAILED DUCK, *Harelda glacialis*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 460.

LONG-TAILED DUCK, Nutt. Man., vol. ii. p. 453.

LONG-TAILED DUCK, *Fuligula glacialis*, Aud. Orn. Biog., vol. iv. p. 103.

Male, 23, 29½. Female, 15¾, 26.

Breeds from Labrador northward to the Arctic Seas. Abundant during

winter along the coasts of the Atlantic Districts to the mouth of the Mississippi. Never in the interior.

Adult Male in summer.

Bill shorter than the head, higher than broad at the base, gradually depressed toward the end, the sides nearly parallel, the tip rounded. Upper mandible with the basal angles inconspicuous, the dorsal line descending and straight to the unguis, then convex and decurved, the ridge broad and flattened at the base, convex toward the end, the sides sloping and convex, the unguis roundish, the edges membranous, very narrow at the base, enlarged towards the end, with about thirty lamellæ ending in a projecting point. Nostrils sub-basal, oblong, direct, large, pervious, near the ridge, in an oblong groove with a soft membrane. Lower mandible flat, a little curved upwards, the angle very long and narrow, the unguis broad and rounded, the erect edges with about forty direct lamellæ.

Head oblong, compressed, of moderate size. Eyes of moderate size. Neck rather short. Body compact, rather elongated, and somewhat depressed. Feet short, stout, placed rather far behind; tarsus very short, compressed, anteriorly with a series of small scutella, externally of which are five in a line with the outer toe, the rest reticulated with angular scales. Hind toe very small, with a free membrane beneath; outer toe, which is the longest, almost double the length of the tarsus, middle toe scarcely shorter than outer; anterior toes with numerous narrow scutella, webbed, the margin of the webs concave; inner toe with a two-lobed expanded margin. Claws small, slightly arched, blunt.

Plumage dense, blended, elastic, stiffish; but soft and glossy on the head; the feathers broad and slightly rounded at the end. Scapulars elongated, acuminate, the posterior decurved over the wing. Wings shortish, narrow, pointed; primary quills curved, strong, tapering, the second longest, exceeding the first by about one twelfth of an inch, the rest rapidly decreasing; secondaries broad and rounded, the inner elongated and pointed. Tail of fourteen pointed feathers, the outer very short, the middle extremely attenuated and slightly recurved, the intermediate proportional.

Bill black in its basal half, orange-yellow towards the end, the unguis bluish-grey. Iris bright carmine. Feet light bluish-grey, the webs dusky, claws black. A large oblong greyish-white patch on each side of the head from the bill to behind the ear; the upper part of the head and nape black, that colour being narrowed in front by the encroachment of the white patches. The neck all round, and anterior half of the breast, of a rich dark chocolate-brown; the back and wing-coverts brownish-black; the scapulars broadly margined with light reddish-brown; the quills are of the same chocolate tint as the breast, the secondaries margined externally with lighter,

the primaries internally. The middle four feathers of the tail brownish-black, the outer two of these slightly margined with white, all the rest white, but the inner with a longitudinal dusky patch on the outer web.

Length to end of tail 23 inches, to end of wings 15, to end of claws 17; extent of wings 29½; wing from flexure 9½; middle tail-feathers 10, lateral tail-feathers 2½; bill along the ridge $1\frac{2}{12}$, along the edge of lower mandible $1\frac{8}{12}$; tarsus $1\frac{2}{12}$; outer toe and claw $3\frac{3}{12}$, middle toe and claw $1\frac{3}{12}$, hind toe and claw $\frac{7}{12}$.

Female in summer.

The female is somewhat less than the male, and differs not only in colour, but in the scapulars, which are not elongated, and in the tail, which is short and rounded. The bill and feet are dusky-green, the iris yellow. The head is dark greyish-brown, with a patch of greyish-white surrounding the eye, but not extending to the bill; there is a larger patch of the same colour on the side of the neck, the hind part of which is similar to the head, the fore part greyish-brown, the feathers broadly margined with whitish. All the upper parts are of a dark greyish-brown, the two lateral tail-feathers edged with white; the lower parts white, the feathers under the wings slightly tinged with grey.

Length to end of tail 15¾ inches, to end of wings 14½, to end of claws 16¾; extent of wings 26½; wing from flexure 8; middle tail-feathers $2\frac{9}{12}$, lateral 2¼; bill along the ridge $1\frac{2}{12}$, along the edge of lower mandible $1\frac{5}{12}$.

Adult Male in winter.

The outer half of the bill rich orange-yellow, that colour extending to the base along the ridge, the unguis and the basal half black, as well as the unguis and edges of the lower mandible. The head, neck, and fore part of back and scapulars, white; the space about the eye pale greyish-red, and a large oblong patch of chocolate-brown on the side of the neck. The upper parts, including the four middle tail-feathers, are brownish-black, but the secondary quills tinged with reddish-brown, and having paler margins. The anterior half of the breast chocolate-brown, the rest of the lower parts and the four lateral tail-feathers white.

Unfledged Young.

The young, when newly excluded, are covered with stiffish down. Bill and feet greenish-dusky; the upper parts chocolate-brown; a small spot of white under the eye; throat and lower parts whitish, as well as an oblong patch on the cheeks.

The young male in winter, that is, after its first moult, has the bill and legs dusky-green. The head and half of the neck are whitish; the upper part of the former and a patch on the side of the latter mottled with brownish-black and chocolate. The upper parts brownish-black, variegated with

brownish-red, the still unelongated scapulars chiefly of the latter colour. A broad undefined belt of reddish-brown over the lower fore part of the neck; the rest of the lower parts greyish-white.

Length to end of tail 22 inches; extent of wings 29.

The young female in winter is similar to the adult, but with the upper parts paler, the light-coloured patches on the head and neck more dusky, and the lower parts of a less pure white.

Adult males, assuming the summer plumage, about April, present a curious intermixture of the variously coloured feathers of the two seasons.

In a male bird, the tongue is 1 inch and 5 twelfths long, papillate at the base, fleshy, with two rows of bristles along the edges. There are 35 lamellæ on each side of the upper, and about 40 on the lower mandible. The œsophagus is 7½ inches long, 7 twelfths in diameter at the upper part, towards the lower parts of the neck dilated to 1 inch, and continuing so to the end. The proventriculus is 1 inch 3 twelfths long, its glandules cylindrical and 2 twelfths long. The stomach is a very powerful gizzard, of a roundish form, 1¾ inches in length, 2 inches and 2 twelfths in breadth; its tendons large; the right muscle 10 twelfths, the left 11 twelfths in thickness. The cuticular lining is thick, and slightly rugous; the grinding plates thicker and denser. The contents of the stomach are small muscles and particles of quartz, some of which are 3 twelfths in diameter. The intestine is 5 feet 6 inches long, its diameter nearly uniform, about 4 twelfths; the rectum enlarged to 5 twelfths, its length 2½ inches. Cœca 4¾ inches long, 3 twelfths in diameter, their extremity rounded; the cloaca globular, about 9 twelfths in diameter.

The trachea, moderately extended, measures 6 inches in length, its breadth at the top 5 twelfths, about the middle 3¾ twelfths. The number of ordinary rings is 72; at the lower part there are 6 expanded rings which are broad posteriorly and on the sides, but extremely narrow before; beyond this is a solid bony expansion of 7 united rings, forming anteriorly a transversely oblong case, having a membrane in front. The contractor muscles are very large, for two inches at the top expanded over the fore part, sending off two cleido-tracheals, then passing down along the edges of the six enlarged rings, and terminating on the drum, where the sterno-tracheals come off.

FAMILY XL.—MERGINÆ. MERGANSERS.

Bill rather long, straight, rather slender but strong, tapering, higher than broad at the base, nearly cylindrical toward the end; upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis suddenly decurved; the ridge broad and flattened at the base, then convex, the sides sloping, toward the end convex, the edges serrate internally with oblique dentiform lamellæ, the unguis oblong, much curved, abruptly rounded at the end; nasal groove elongated, covered by the soft skin of the bill; lower mandible with the angle very narrow and extended to the unguis, which is obovate, the sides nearly erect, with a long narrow groove, the edges internally serrate, the unguis convex, thick-edged. Head rather large, compressed, oblong; neck of moderate length; body full, depressed, rather elongated. Feet placed far behind, stout; tibia bare for a short space; tarsus very short, compressed, anteriorly covered with small scutella, and another series on the lower half externally. Hind toe very small, with an inferior free membrane; anterior toes half as long again as the tarsus, second shorter than the fourth, which is almost as long as the third, all scutellate, and connected by anteriorly concave webs. Claws rather small, moderately arched, compressed, acute. Plumage moderately full, dense, soft, glossy, blended beneath. Wings of moderate breadth, convex, acute; inner secondaries elongated and tapering. Tail short, much rounded, of more than twelve feathers. Upper mandible with an internal series of small papillæ or laminæ on each side, besides those on the margin. Tongue long, fleshy, emarginate and papillate at the base, tapering, with a double row of slender reversed papillæ along the upper surface, and two lateral series of filaments on each side, the tip lacerated; œsophagus very wide, of nearly uniform diameter; stomach a strong gizzard of moderate or small size, with the lateral muscles thick; the epithelium dense and longitudinally rugous; intestine long, rather narrow; cœca rather long; cloaca globular. Trachea with one or two extensive dilatations, besides the enormously developed tympanum at the bifurcation; no inferior laryngeal muscles. Nest on the ground, or in hollow trees. Eggs numerous.

GENUS I.—MERGUS, *Linn.* MERGANSER.

Character as above.

Buff breasted Merganter Goosander

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

1. Male. 2. Female.

Lith.ed Printed & Col.d by J. T. Bowen, Philad.a

BUFF-BREASTED MERGANSER, OR GOOSANDER.

MERGUS MERGANSER, *Linn.*

PLATE CCCCXI.—MALE AND FEMALE.

This species may be said to be a constant resident with us, as many individuals breed in the interior of the states of New York, Massachusetts, and Maine. When I first resided in Kentucky, some bred there also, although at the present day none pass the summer in that country. In the latter part of autumn, in winter, and in early spring, they are found in all parts of the Union; in Texas I procured some in April, 1837, and in the beginning of May saw a considerable flock in Galveston Bay. How much farther southward their migrations extend I know not, but from having observed them coming from that direction, I suspect that they advance pretty far into the interior of Mexico, from which some perhaps cross to the Arkansas river, on which I have also seen them. On the Mississippi, the Ohio, and their tributaries, Goosanders are found during the coldest weather; and when the larger streams are covered with ice, they betake themselves to such smaller creeks as have very rapid currents or cascades, about which they feed. But there are parts of our southern coast, where they are exceedingly rare, such as South Carolina, where my friend Dr. BACHMAN has never seen one, and the Floridas, in which none occurred to me during my rambles there. Indeed one is surprised to find that among birds like this, which is so hardy as to remain in our North-eastern States during the severest part of the winter, some should extend their movements at the same season as far to the south-west as Texas; but facts like these are beyond our philosophy. In the lower parts of Louisiana, this species is called the "Bec-scie-de-mer," probably because there it is found only on the large salt-water lakes, and about the mouths of the Mississippi, and to distinguish it from the Hooded Merganser, which there is more usually seen on fresh water. I have been assured by Professor MACCULLOCH of Pictou that it now and then breeds in Nova Scotia. Yet I found none in Labrador or Newfoundland, where the Red-breasted species was breeding in great numbers. Dr. RICHARDSON found it in abundance in the Fur Countries.

The Goosander is a vigorous and robust bird. It swims deeply, but with considerable speed, even against a strong current, running waters being

generally preferred by it, even when rather shallow, provided their beds are of sand or pebbles, for it is rarely seen on muddy or stagnant waters, even during the breeding season, when it returns to the inland lakes. Like the Grebes it has the power of sinking backwards, and it dives expertly, remaining occasionally several minutes beneath the surface. It usually swims and dives against the current, and close by the shores, extricating itself from floating ice by passing under it. Its voracity is great, so that it consumes an extraordinary quantity of fish. I have found fishes in its stomach seven inches in length, and of smaller kinds so many as to weigh more than half a pound. Digestion takes place with great rapidity, insomuch that some which I have fed in captivity devoured more than two dozen of fishes about four inches in length, four times daily, and yet always seemed to be desirous of more. The alleged awkwardness of this bird when on shore is a fable, for I have seen individuals while courting in spring run with great celerity fifty or more yards at a time, keeping nearly in an erect position. On occasions of this kind I have observed on the sand-bars of the Mississippi flocks of seven or eight males chasing each other with great animosity. At other times, however, they are not fond of walking much, but when on shore are generally seen lying flat on the ground. At times the Mergansers rise almost at once on wing from the water, but at others they seem to find considerable difficulty, patting it with their feet for many yards. These differences seem to depend on various circumstances, such as their being suddenly surprised, or during violent winds. They generally, if not always, rise on wing against the breeze.

The flight of the Goosander is powerful, and as rapid and sustained as that of the Red-breasted and Hooded Mergansers. When fairly under way and at a good height, they advance in an almost direct course and proceed with surprising velocity, so that, when suddenly apprised of the vicinity of man they at times find it difficult to check their speed so quickly as may be necessary for their safety. I well remember that on several occasions having watched one of these birds flying directly up a creek and towards me, I have taken aim at it and fired when it was at the proper distance, and yet such had been its velocity that it would advance, after being shot, many yards towards me. When rising from the water, whatever number may be in the flock, they all start together, paddle off with their feet and wings, stretching out their necks, and thus run as it were on the water to the distance of twenty or thirty yards with great velocity, extending in a front, or following each other in a line, according to the extent of the space before them. They then gradually ascend to the height of the trees, and move off to some considerable distance, but often return to the same place. They seem to ascertain the fertility of the waters by sipping a little on their

alighting, and then, having found appearances favourable, they open their bills, apparently to take a deep inspiration, and immediately dive. When they have procured a sufficiency of food, they betake themselves to some sand-bar, on which they repose until it is digested.

The Goosander rises to the surface with the fish in its bill, and, shifting it about until it is in a proper position, swallows it head-foremost, then dives for more. So deeply does it swim, that on such occasions not more than a third of its body is seen on the surface; and there is very little chance of shooting it, for it dives on seeing the flash, or even on hearing the click of the lock. The only chance of procuring one at such times is when, on coming to the surface, it stretches itself up and beats its wings. If it is only wounded, it often exhibits great tenacity of life, and diving at once, remains a long time in the water. On emerging, it is seen shaking its head violently, for the purpose of disgorging its food, and, perhaps, the blood that has flowed into its lungs; and, on effecting this, it again plunges headlong. At length, you see it come to the surface, with its beautifully tinged breast upwards; but if your object be to obtain game, you will have little satisfaction in procuring a Goosander or any of its genus, for they are all fishy, oily, tough, and fitted for the palate of none but experienced epicures. The food of the Goosander consists chiefly of fish, but also of bivalve shells, snails, leeches, aquatic lizards, crays, and frogs.

Now, good reader, spring has once more gladdened the face of nature, pearly drops hang on every leaf, glistening in the bright sunshine, and thousands of gay insects flutter around. My light canoe is ready. Leap in, seat yourself snugly in the bow, and sit still while I paddle you to the green islands of this beautiful lake, where we shall probably find a Merganser or two, perhaps a female sitting on her eggs. As to the dog, we need him not; so lie thee down, Baron, until I return. I was always fond of "paddling my own canoe," and I never met with a single accident so long as I managed it myself; but on more occasions than one I have been turned out as gently as one turns himself in bed, and having put the frail bark to rights, have assisted the awkward fellow who had caused the disaster, dived for his gun and my own, and conducted him to the camp to dry his garments. Therefore, be quiet, and fear nothing. How smooth and silvery are the pure waters, how beautiful those tall trees! The dogwood is in full bloom, so are the maples, whose rich red blossoms cluster on the twigs. Here we are just entering the rushes of this little island. Get out, and wade to the shore with all possible gentleness; or allow me to do so; for to lighten our slight bark, one of us must get into the water. Softly we advance as I pull the canoe by the bow; but now, squat, for here are tracks of the Goosander. There now lies the female close before us. She thinks we have not seen her, for

she crouches closer upon her eggs. Alarm her not, or she will soon depart. There she croaks, and scrambling off through the tall grass, flies off on rapid wings. Look at the nest! count the eggs if you choose, but allow me, if you please, to describe them.

The islands on which the Goosander is wont to breed are mostly small, as if selected for the purpose of allowing the sitting bird to get soon to the water in case of danger. The nest is very large, at times raised seven or eight inches on the top of a bed of all the dead weeds which the bird can gather in the neighbourhood. Properly speaking, the real nest, however, is not larger than that of the Dusky Duck, and is rather neatly formed externally of fibrous roots, and lined round the edges with the down of the bird. The interior is about seven and a half inches in diameter, and four inches in depth. There are seldom more than seven or eight eggs, which measure two inches and seven-eighths in length, by two inches in breadth, are of an elliptical form, being nearly equally rounded at both ends, smooth, and of a uniform dull cream-colour. The young are led to the water in a few hours after they are hatched, and are covered with fur-like hair, of a reddish-brown colour about the head and neck, the body lightish grey. They are excellent divers, and run on the surface with surprising velocity; but they are not able to fly for nearly two months, when, being fat, they are easily fatigued if closely pursued, and on such occasions will often betake themselves to the shore, lie down, and even allow you to lay hold of them. My friend THOMAS NUTTALL has given an interesting account of his chase of a brood of Goosanders.

"Early in the month of May, 1832, while descending the Susquehanna near to Dunstown, a few miles below the gorge of the Alleghanies, through which that river meanders near the foot of the Bald Eagle Mountain, G. LYMAN, Esq., and myself observed, near the head of a little bushy island, some Wild Duck, as we thought, with her brood making off round a point which closed the view. On rowing to the spot, the wily parent had still continued her retreat, and we gave chase to the party, which with all the exertions that could be made in rowing, still kept at a respectful distance before us. We now perceived that these diminutive possessors of their natal island were a female Goosander or Dun Diver, with a small but active little brood of eight young ones. On pushing the chase for near half an hour, the young, becoming somewhat fatigued, drew around their natural protector, who now and then bore them along crowding on her back. At length, stealing nearly from our sight, as the chase relaxed, the mother landed at a distance on the gravelly shore, which being nearly of her own grey colour and that of her family, served for some time as a complete concealment. When approached again, however, they took to the water, and after a second

attempt, in which the young strove to escape by repeated divings, we succeeded in cutting off the retreat of one of the family, which was at length taken from behind a flat boat under which it had finally retreated to hide. We now examined the little stranger, and found it to be a young Merganser of this species, not bigger than the egg of a Goose, and yet already a most elegant epitome of its female parent, generally grey, with the rufous head and neck, and the rudiments of a growing crest. After suffering itself to be examined with great calmness, and without any apparent fear, we restored it to its more natural element, and, at the first effort, this little diminutive of its species flew under the water like an arrow, and coming out to the surface only at considerable distances, we soon lost sight of it, making good its aquatic retreat in quest of the parent. On inquiry, we learned from the tavern-keeper, that for several years past a nest or brood of these birds had annually been seen near this solitary and secluded island."

The male Goosanders leave the females immediately after incubation has commenced, and are then seen in the wildest parts of the country. Several females are often found breeding on the same island, and it is after their young are pretty well grown, that they moult. For a number of years past, I have sometimes entertained a hope, at the approach of the breeding season, of finding a male Goosander having his head adorned with a broad erectile crest, like that of the female and young, but I have hitherto been disappointed, and am therefore unable to say whether such a crest ever exists in that sex. The young of both sexes retain the colouring of the female for two years, during which time the males can be distinguished from the females only by their being much larger. The males have not the rich buffy tint on the breast until about two years after they have commenced breeding, and the first perceptible change by which their sex is distinguished is the appearance of black feathers on the head and neck. Until of late years, the females were thought to be of a distinct species, to which the name of Dun Diver was given.

Many writers have said that this bird breeds in the hollows of trees, or on their branches; but of the various nests which I have found, not one occurred in such situations; and the Hooded Merganser is the only species of this genus which I have observed nestling in an elevated place.

The notes of the Goosander are harsh, consisting of hoarse croaks, seldom uttered unless the bird be suddenly startled, or when courting. The females are usually silent, but when with their young brood, and pursued, they emit the same guttural sounds as the males. Goosanders are easily caught with hooks baited with fish; my friend JOHN BACHMAN has procured them in this manner on the Hudson River, and I also have on the Ohio.

Along with the representation of a pair of adult birds of this species, I have given a correct view of the Cohoes Falls, in the State of New York.

Goosander, *Mergus Merganser*, Wils. Amer. Orn., vol. viii. p. 68.
Mergus Merganser, Bonap. Syn., p. 397.
Mergus Merganser, *Goosander*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 461.
Goosander, *Mergus Merganser*, Nutt. Man., vol. ii. p. 460.
Goosander, *Mergus Merganser*, Aud. Orn. Biog., vol. iv. p. 261.

Male, 27, 36. Female, 24, 34.

In winter dispersed over the United States, and westward as far as Texas. Breeds from Massachusetts northward, and along the Great Lakes.

Adult Male.

Bill about the length of the head, straight, strong, tapering, higher than broad at the base, nearly cylindrical toward the end. Upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis suddenly decurved; the ridge broad at the base, then convex; the sides sloping rapidly at the base, convex toward the end; the edges serrated beneath; the unguis oblong, much curved, abruptly rounded at the end. Nasal groove elongated; nostrils submedial, linear, direct, pervious. Lower mandible with the angle very narrow, and extended to the unguis, which is obovate; the sides nearly erect in their outer half, with a long narrow groove, the edges serrate within.

Head rather large, compressed, oblong. Neck rather short, thick. Body full, depressed. Feet placed far behind, short, stout; tibia bare for about a quarter of an inch; tarsus very short, compressed, anteriorly covered with small scutella, and another row on the lower half externally, the sides reticulate. Hind toe very small, with an inferior free membrane; anterior toes half as long again as the tarsus; second shorter than fourth, which is almost as long as the third, all connected by reticulated webs, which are deeply concave; the outer toe slightly margined, the inner with a broad marginal membrane. Claws rather small, moderately arched, compressed, acute, that of the middle toe with a thin inner edge.

Plumage moderately full, dense, soft, glossy. Feathers of the head and neck silky, blended, elongated along the median line, so as to form a not conspicuous crest; of the back rather compact; of the lower parts blended. Wings short, of moderate breadth, convex, acute; primaries narrow, tapering, the first scarcely shorter than the second, the rest rapidly graduated; secondaries rather short, narrow, rounded, the inner elongated and tapering. Tail short, much rounded, of eighteen rather narrow rounded feathers.

Bill bright vermilion, with the unguis black. Iris carmine. Feet orange-red in winter, bright vermilion in the breeding season. Head and upper

half of neck greenish-black, splendent, with bright green reflections; hind part of the neck below white; fore part of neck and all the under parts of a delicate reddish-buff; the sides of the rump and part of the abdomen greyish-white, finely undulated and dotted with dark grey; some of the lower wing-coverts dusky, the larger coverts and primaries light grey. The fore part of the back, and the inner scapulars, glossy black; the hind part ash-grey, becoming lighter and finally undulated on the rump. Upper tail-coverts and tail-feathers deep grey, outer scapulars white; a transverse band of black at the base of the wing, concealed by the scapulars. Wing-coverts white; alula, primary coverts, primary quills, and a band formed by the base of the first row of large coverts, black; secondaries white, six of them margined externally with a black line, the innermost margined on both webs, but more broadly on the inner, and with the tip black.

Length to end of tail 27 inches, to end of claws 26½, to end of wings 24, to carpal joint 13⅝, to end of green on the neck 7½; extent of wings 36; bill along the ridge $2\frac{8}{12}$, along the edge of lower mandible $3\frac{1}{12}$; wing from flexure 11¼; tail 5; tarsus $1\frac{10}{12}$; first toe and claw $\frac{12}{12}$; outer toe $2\frac{7}{12}$, its claw $\frac{11}{12}$; middle toe $2\frac{8}{12}$, its claw $\frac{8}{12}$. Weight 5 lbs. Of another 3¾ lbs.

Dimensions of two other Males:

Length to end of tail,	26	25⅞ inches.
..... claws,	27	25
..... wings,	24	23½
Extent of wings,	38	35

Female.

The female is much smaller. The bill, eyes, and feet are coloured as in the male, but the ridge of the bill is black, and the nail whitish; the longitudinal crest is much more elongated, being composed of linear feathers, some of them fully two inches and a half long. Head and upper part of neck brownish-red; throat white; all the upper parts, with the sides of the body and rump, deep ash-grey, the feathers paler at the margin. Smaller wing-coverts and inner secondaries grey; bases and tips of secondary coverts black, the intermediate part white; middle secondaries white, outer and primaries black; anterior part of neck below faintly banded with ash-grey; breast and abdomen white, slightly tinged with buff.

Length to end of tail 24 inches, to end of claws 23½, to end of wings 20¾; extent of wings 34; bill along the ridge $1\frac{11}{12}$, along the edge of lower mandible 2⅛; wing from flexure 10¼; tail 4½; tarsus $1\frac{9}{12}$; hind toe and claw $\frac{11}{12}$; middle toe $2\frac{4}{12}$, its claw $\frac{4}{12}$; outer toe $2\frac{4}{12}$, its claw $\frac{4}{12}$.

The young males after the autumnal moult, and until the middle of summer, resemble the females.

An adult male obtained near Boston examined. The heart is 2 inches

long; the lobes of the liver are nearly equal, the right being 3 inches 7 twelfths long, the left 3 inches 3 twelfths.

The upper mandible has about 28 recurved conical, acute, horny papillæ, and an internal series of smaller, on each side; the tip of the unguis serrulate; on the lower mandible are about 40 of the same nature. The tongue is 2 inches 1 twelfth long, fleshy, emarginate, and papillate at the base, tapering, with a double row of slender reversed papillæ along the upper surface, and two lateral series of filaments on each side; the tip lacerated, horny on the back. Posterior nasal aperture oblong, 10 twelfths in length, papillate on the edges. Aperture of the glottis 4½ twelfths long. The mouth is 10 twelfths in breadth, but may be extended to 1 inch 9 twelfths. The œsophagus is 10¼ inches long, its diameter 1 inch 7 twelfths on the neck, contracting to 8 twelfths as it enters the thorax, but again expanding; the external coat of transverse muscular fibres very thick; the internal layer of longitudinal fibres very distinct; the mucous coat thrown into prominent longitudinal plaits when contracted; the mucous follicles disposed in longitudinal single series. The proventriculus is 2 inches long, the glandules very numerous, oblong, about 2 twelfths in length, forming a complete belt. The stomach is a strong gizzard, of moderate size, 2 inches long, the lateral muscles 5 twelfths thick; the epithelium very thick, nearly 1 twelfth, longitudinally rugous. In the stomach and gullet was a fish 9 inches long, the portions lying in the stomach and proventriculus partially dissolved, the rest 4 inches long, not acted upon; there were also two fragments of quartz, one of them a quarter of an inch long. The intestine is long, measuring 6 feet 3 inches, its diameter from 5 to 3 twelfths. The cœca are 3 inches long, for half an inch 1½ twelfths in diameter, in the rest of their extent 4 twelfths. The rectum 5 inches long, including the cloaca, which has a diameter of an inch and a quarter.

The trachea, 10½ inches long, has at first a diameter of 4 twelfths, dilates gradually to 8 twelfths, then contracts to 4 twelfths, enlarges a second time to 7 twelfths, and gradually contracts to 3 twelfths. In this space the rings, 146, are strong, broad, and osseous. At its lower part is an enormous dilatation composed of numerous united rings, bulging irregularly on the right side and behind, and on the left expanded into a case having two large spaces filled by membrane; the greatest diameter of this tympanum is 2 inches and 2 twelfths. The bronchi come off at the distance of nearly an inch from each other, and are short, but wide, with about 25 half-rings. The lateral or contractor muscles are very strong, give off a pair of cleido-tracheals from the second enlargement, and at the commencement of the labyrinth the sterno-tracheals, which are also very large; but there are no other inferior laryngeal muscles.

Red-breasted Merganser

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

1. Male. 2. Female.

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

The intestine of a male in the first winter is 6 feet 8 inches long, its greatest diameter half an inch, wider towards the rectum than at the upper part, where the diameter is 4 twelfths. Rectum 4¼ inches long, exclusive of the cloaca. Cœca 2¾ inches. Contents of stomach, remains of fishes and a great quantity of quartz fragments.

An adult female. Œsophagus 10½ inches long; stomach 2 inches long; intestine 5 feet 3 inches; rectum 4½; cœca 2 7/12. The trachea 9 inches long, of uniform diameter, 4 twelfths, with a very slight dilatation toward the lower part, and at the lower larynx contracted to 3 twelfths; the last ring is very large, laterally dilated, but symmetrical; the bronchi come off at the distance of 5 twelfths from each other, and are composed of 25 rings. The tracheal rings 150.

RED-BREASTED MERGANSER.

MERGUS SERRATOR, *Linn.*

PLATE CCCCXII.—MALE AND FEMALE.

The range of the Red-breasted Merganser is of vast extent. In North America I have found it pretty generally dispersed during winter and even to a late period in spring, from Texas to Labrador; and in the Fauna Boreali-Americana Mr. SWAINSON describes a male killed on the Saskatchewan. No date is mentioned, nor is any thing said as to its habits, which would lead me to believe that it must be a rare bird in the Fur Countries. It is found on the western coast, however, and has been shot not far from the mouth of the Columbia river by a gentleman of Boston engaged in the fur-trade, and who is well acquainted with the water-birds of our country. In winter it is to be met with throughout the Union, on almost every unfrozen stream; but when the cold increases so as to close the waters it removes southward until it finds a suitable place.

This species is by choice mostly dependent on fresh water for its sustenance; but when the winters are very severe it throws itself into the salt lagoons or bays, and there seeks for prey to which it is not well accustomed, and which is rather more difficult to be overtaken, than that which is confined in the narrow mountain-streams for which it shews a

natural predilection greater than even that of the Goosander, *Merguś Merganser*. It breeds in many parts of our Middle and Eastern States, and on two occasions I have found the female in charge of her brood in the lower parts of Kentucky. In the States of New York, Massachusetts, and Maine it is by no means a rare occurrence to meet with the nest of this bird along the borders of small secluded lakes. It is as common at this season in the British provinces of New Brunswick and Nova Scotia, and it is still more plentiful on the islands of the Gulf of St. Lawrence, as well as on the streams of Newfoundland and Labrador.

The Red-breasted Merganser is best known throughout the United States by the name of "Shell-drake." It is, like all the species of its tribe, a most expert diver, and on being fired at with a flint-locked gun generally escapes by disappearing before the shot reaches the place where it has been. Its flight is similar to that of the Goosander, being strong, rapid, and remarkably well sustained when it is travelling to a considerable distance. Gluttonous in the extreme, it frequently gorges itself so as to be unable to rise. I have several times seen one of them obliged to eject a great part of the contents of its stomach and gullet before it could fly off, and some which I have kept a day or two in confinement have died in consequence of swallowing too many fishes.

The "Shell-drake," according to the latitude of the place which it has selected, and the degree of forwardness of the season, begins to form its nest from the first of March until the middle of May. Some nests which I examined in Labrador had not their full complement of eggs until about the 20th of June. In that country, as well as in several parts of the United States, where I have found the nests, they were placed within a very short distance of the margins of fresh-water ponds, among rank grasses and sedges, or beneath the low bushes. The nest bears a great resemblance to that of the Eider Duck, but is a good deal smaller, and better fashioned. It is made of dry weeds and mosses of various kinds, and is warmly lined with down from the breast of the female bird, for the male leaves her as soon as she has completed the laying of the eggs, the number of which I have never found to exceed ten, they being more frequently six or eight. It is a very remarkable fact that the eggs in this family of birds are usually even in number, whereas in most land birds they are odd. The eggs of the Red-breasted Merganser measure two and a half inches in length, an inch and five-eighths in breadth, resemble in form those of the domestic fowl, and are of a uniform plain dull yellowish cream-colour.

When one approaches the nest, the female usually slides or runs off a few paces, and then takes to wing. I have never observed the paths to the nests which some authors have described, and cannot well imagine why there

should be any such, as this bird is capable of taking flight as readily as any with which I am acquainted. It uses the greatest precaution in retiring to the nest; and on more occasions than one I have remained well concealed at a short distance for upwards of an hour before the bird came back to her eggs. Perhaps this may tend to shew that there is less necessity for keeping the eggs warm, even when they are about to be hatched, in this than in other species, which are known to resume incubation as soon as possible.

The young betake themselves to the water a few hours after birth, and are from the first so expert at diving as to be procurable only with great difficulty. Indeed, when they are about a fortnight old, they move with astonishing rapidity, whether on the surface, where they run with almost the speed of a greyhound, or in the water itself, in which they shew themselves as much at home as if they were seals or otters. The only means of catching them that I have found successful is to throw stones at them, whenever they rise, until becoming fatigued, they make for the shore, where they stretch themselves out and remain quite still, so that you may go up to them and take them with the hand.

At the approach of autumn they resemble the old females; but the sexes can easily be distinguished by examining the unguis or extremity of the upper mandible, which will be found to be white or whitish in the males, and red or reddish in the females. The young males begin to assume the spring dress in the beginning of February, but they do not acquire their full size and beauty until the second year.

The Red-breasted Merganser is a shy bird. The males especially are extremely suspicious and vigilant, after they have left the females incubating, and when they congregate in flocks of from five to twenty on some sequestered clear stream, to renew their plumage. The moult is completed in the end of July or beginning of August, and at that season I had the greatest difficulty in procuring them, for, being then almost unable to rise from the water, they seemed to dive with an alertness proportionally greater.

The flesh of this bird is tough, and has a fishy taste. I have represented a male and a female, along with a new species of *Sarracenia*, which is found abundantly from Pensacola to Georgia, as well as in some parts of South Carolina.

Red-breasted Merganser, *Mergus Serrator*, Wils. Amer. Orn., vol. viii. p. 91.

Mergus Serrator, Bonap. Syn., p. 397.

Mergus Serrator, *Red-breasted Merganser*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 462.

Red-breasted Merganser, Nutt. Man., vol. ii. p. 463.

Red-breasted Merganser, *Mergus Serrator*, Aud. Orn. Biog., vol. v. p. 92.

Male, 24½, 33. Female, 24, 34½.

From Texas westward to the Columbia river and northward. Common during autumn and spring. Also throughout the United States, and along the Atlantic shores. Breeds from New York to Labrador and the Fur Countries, as well as along the Great Lakes, and on the Rocky Mountains.

Adult Male.

Bill about the length of the head, straight, strong, tapering, higher than broad at the base, nearly cylindrical toward the end. Upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis suddenly decurved; the ridge flattened at the base, and gradually becoming convex; the sides sloping rapidly at the base, convex toward the end, the edges serrated beneath; the unguis oblong, much curved, abruptly rounded at the end. Nasal groove elongated; nostrils sub-basal, linear, direct, pervious. Lower mandible with the angle very narrow, and extended to the unguis, which is obovate; the sides nearly erect in their outer half, with a long narrow groove, the edges serrate within.

Head rather large, compressed, oblong. Neck rather long and somewhat slender. Body full, depressed. Feet placed far behind, short, stout; tibia bare for about a quarter of an inch; tarsus very short, compressed, anteriorly covered with small scutella, and another row on the lower half externally, the sides reticulated, the hind part thin edged. Hind toe very small, with an inferior free membrane; anterior toes half as long again as the tarsus; second shorter than fourth, which is almost as long as the third, all connected by reticulated webs, which are deeply concave at the margin; the outer toe slightly margined, the inner with a broad marginal membrane. Claws rather small, very slightly arched, compressed, acute, that of the middle toe with a thin inner edge.

Plumage moderately full, dense, soft, glossy. Feathers of the head and upper part of the neck somewhat silky, blended, very narrow, elongated along the median line, so as to form a very conspicuous erectile crest, divided into two parts, those below the upper occipital region and the nape being shorter, leaving two long tufts. Feathers of the back rather compact, of the lower parts blended. Wings short, of moderate breadth, convex, acute; primaries narrow, tapering, the first longest, the second only half a twelfth shorter, the rest rapidly graduated; secondaries rather short, narrow, rounded, the inner elongated and tapering. Tail short, much rounded, of eighteen rounded sub-acuminate feathers.

Bill deep carmine, dusky along the ridge, the unguis yellowish. Iris carmine. Feet bright red, claws greyish-yellow. Head and upper part of neck greenish-black, glossy, with bright green reflections along the sides, and purplish on the crest. On the middle of the neck is a broad ring of white; and on its lower part a broad band of light brownish-red, longitu-

dinally streaked with dusky, each feather being laterally margined with that colour. The lower parts are pure white, excepting the sides of the body and rump, which are transversely undulated with greyish-black, and the larger wing-coverts, which are ash-grey. The fore part of the back, and the inner scapulars, are deep black; the feathers at the shoulder, or anterior to the wing, white, with a broad margin of black; some of the anterior wing-coverts ash-grey; the other small wing-coverts, the outer scapulars, and the terminal half of the secondary coverts, pure white; the basal portion of the latter, the primary coverts, and primary quills, black, the latter tinged with brownish-grey; the secondaries white, with their base and the outer margin of most black, which colour predominates on the inner. The middle and hind part of the back ash-grey, undulated with white and dusky; the tail brownish-grey.

Length to end of tail 24½ inches; to end of wings 22½; to end of claws 25½; extent of wings 33; bill along the ridge $2\frac{3}{12}$; wing from flexure 9½; tail $3\frac{6}{12}$; tarsus $1\frac{7}{12}$; hind toe $\frac{11}{12}$, its claw $\frac{2}{12}$; inner toe $1\frac{10}{12}$, its claw $\frac{4}{12}$; middle toe $2\frac{4}{12}$, its claw $\frac{4}{12}$; outer toe $2\frac{5}{12}$, its claw $\frac{3}{12}$. Weight 2lbs. 8 oz.

Adult Female.

The female, which is of about the same size, differs in having the crest shorter, and in wanting the broad abruptly-terminated feathers anterior to the wing. The bill and feet are of a paler tint; the head and fore part of the neck light reddish-brown, the throat and all the under parts white, excepting the sides of the body and rump, and the larger wing-coverts, which are brownish-grey. The hind neck, back, tail-coverts, tail, scapulars, and wing-coverts are brownish-grey, the feathers margined with paler. The wings are greyish-black, with a large white patch, formed by the terminal portions of the secondary coverts, and the greater part of some of the outer secondaries.

Length to end of tail 24 inches, to end of claws 24½; extent of wings 34½, bill along the ridge $2\frac{3}{12}$; wing from flexure 9½; tail 3½. Weight 2 lbs. 13 oz.

The young of both sexes when fully fledged resemble the female. The males assume the plumage of the adult at their second moult. When about a fortnight old, the young, such as I found them in Labrador, are entirely covered with soft down, which is dusky reddish-brown on the head and hind neck, greyish-brown on the back, with three white patches on each side, one terminating the wing, another a little behind it, the third, which is larger, behind the leg. The lower parts greyish-white; a white band from the eye to the bill, a reddish-brown band under the eye and along the side of the neck.

An adult male examined. The roof of the mouth is flat, with a median prominent line; the upper mandible with about 35 conical, compressed,

recurved, tooth-like lamellæ on each side ; the lower with about sixty. The aperture of the mouth is dilatable to 1½ inches, but in its ordinary state measures only 9 twelfths across. The tongue is narrow, tapering, 1 inch 8 twelfths long, with numerous papillæ at the base, and lateral series of recurved bristles. The aperture of the ear, as in all the diving piscivorous birds, is extremely small, being only ½ twelfth in diameter, and in this respect resembling that of the Seals among the Mammalia. This kind of ear forms the extreme contrast to that of the nocturnal rapacious land birds. In the Ducks and Geese it is also small, but much superior in size to that of the Mergansers. The œsophagus, *a b c d*, is 12 inches long, its diameter at the upper part 1½ inches, farther down 1 inch and 7 twelfths, within the thorax 1 inch 4 twelfths, at the proventriculus 1½ inches. It is thus extremely wide, like that of other diving piscivorous birds. The stomach, *d e*, is roundish, of moderate size, 1 inch 8 twelfths in length, 1 inch 11 twelfths in breadth. Its lateral muscles are of moderate thickness, its epithelium tough, with two grinding surfaces of a roundish form, and thus resembling that of Ducks. The contents of the stomach are remains of fishes and a great quantity

Fig. 1.

Fig. 2.

of gravel. The inner surface of the œsophagus is very smooth when extended, plicate when contracted, with longitudinal series of mucous crypts with wide apertures, which become more numerous and close toward the proventriculus. The glandules of the latter organ are irregularly distributed, forming a belt 1½ inches in breadth. They are cylindrical, the largest being ¼ inch long, and 1½ twelfths broad. The duodenum, *f g*, has a diameter of 7½ twelfths, but beyond its curve contracts to 3½ twelfths. The intestine is convoluted into numerous folds; its length is 5 feet 2 inches, its diameter about 3 twelfths; but that of the rectum 4½ twelfths. The cœca, Fig. 2, which come off at the distance of 4 inches from the extremity, are 11 twelfths long, 2½ twelfths in their greatest diameter, and obtuse at their extremity.

The trachea is 11½ inches long, and is remarkable for a large dilatation above the middle, 2 inches in length and 11 twelfths in breadth, below which the tube becomes ¼ inch in diameter, afterwards enlarges to 4½ twelfths, then continues 4 twelfths, and ends in an enormous dilatation of an irregular form, of which the greatest diameter is 2 inches. It is composed of a bony frame, with two lateral membranous spaces. The rings of the trachea, 152 in number, are broad and firmly ossified, but about 30 at the lower part are very narrow in their anterior half; about ten are incorporated with the dilatation; the contractor muscles are very large, expand over the sides of the dilated part, and continue downwards, becoming narrower, and ending at the commencement of the tympanum. There is a pair of very large cleido-tracheal muscles, and another of sterno-tracheal; but there are no inferior laryngeal muscles properly so called, the slip from the contractor ending without reaching the last ring. The bronchi come off at the distance of 9 twelfths from each other, and are short, but wide, and composed of about 20 half rings.

In the trachea of a female, which is of a nearly uniform diameter throughout, the number of rings is 150, with 10 united rings, 5 of which extend beyond the bone of divarication, forming the lower larynx, which has no remarkable dilatation. The bronchial half rings are 20.

THE HOODED MERGANSER.

MERGUS CUCULLATUS, *Linn.*

PLATE CCCCXIII.—MALE AND FEMALE.

Excepting the Smew or White Nun, the Hooded Merganser is the handsomest of its family. Its broad and rounded crest of pure white, with an edging of jetty black, and which it closes or spreads out at pleasure, renders the male of this species conspicuous on the waters to which it resorts. The activity of its motions, the rapidity of its flight, and its other habits, contribute to render it a pleasing object to the student of nature, not less than to the sportsman. Its flesh, however, has a fishy taste and odour, although it is relished by some persons. It seems to prefer fresh water, and is by no means very frequent along the sea coast. Long, narrow, and moderately deep creeks, or small ponds, are more frequented by it than large rivers or lakes.

On the waters of the Western and Southern States, these Mergansers are seen to arrive from the north early in October, but generally later than many species of Ducks, although sooner than either the Red-breasted Merganser or the Goosander. At the approach of night, a person standing still on the banks of such a river as the Ohio, first hears the well-known sound of wings whistling through the air, presently after, a different noise, as if produced by an Eagle stooping on her prey, when gliding downwards with the rapidity of an arrow, he dimly perceives the Hooded Mergansers sweeping past. Five or six, perhaps ten, there are; with quick beats of their pinions, they fly low over the waters in wide circles. Now they have spied the entrance of a creek; there they shoot into it, and in a few seconds you hear the rushing noise which they make as they alight on the bosom of the still pool. How often have I enjoyed such scenes, when enticed abroad by the clear light of the silvery moon, I have wandered on the shores of *la belle rivière*, to indulge in the contemplation of nature!

Up the creek the Mergansers proceed, washing their bodies by short plunges, and splashing up the water about them. Then they plume themselves, and anoint their feathers, now and then emitting a low grunting note of pleasure. And now they dive in search of minnows, which they find in abundance, and which no doubt prove delicious food to the hungry travellers.

Hooded Merganser.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

1. Male. 2. Female.

Lith.ed Printed & Col.d by J.T.Bowen Philad.a

At length, having satisfied their appetite, they rise on wing, fly low over the creek with almost incredible velocity, return to the broad stream, rove along its margin until they meet with a clean sand-beach, where they alight, and where, secure from danger, they repose until the return of day. A sly racoon may, when in search of mussels, chance to meet with the sleeping birds, and surprise one of them; but this rarely happens, for they are as wary and vigilant as their enemy is cunning, and were the prowler to depend upon Hooded Mergansers for food, he would be lean enough.

This bird ranges throughout the United States during winter, content with the food it meets with in the bays and estuaries of the eastern coast, and on the inland streams. The dam of the Pennsylvania miller is as agreeable to it as that of the Carolina rice-planter. The Lehigh and Brandywine creek have their fishes, as well as the waters of Bear Grass or Bayou Sara. Nay, the numerous streams and pools of the interior of the Floridas are resorted to by this species, and there I have found them full of life and gaiety, as well as on the Missouri, and on our great lakes. When the weather proves too cold for them, they move southwards, many of them moving towards Mexico.

The Hooded Merganser is a most expert diver, and so vigilant that at times it escapes even from the best percussion gun. As to shooting at it with a flint lock, you may save yourself the trouble unless you prevent it from seeing the flash of the pan. If you wound one, never follow it: the bird, when its strength is almost exhausted, immerses its body, raises the point of its bill above the surface, and in this manner makes its way among the plants, until finding some safe retreat along the shore, it betakes itself to it, and there remains, so that you may search for it in vain, unless you have a good dog. Even on wing it is not easily shot. If on a creek ever so narrow, it will fly directly towards its mouth, although you may be standing knee deep in the middle. It comes up like a ball, rises and passes over head with astonishing speed, and if you shoot at it, do not calculate upon a hit. You may guess how many one may shoot in a day.

When I removed from Pennsylvania to Kentucky, the Hooded Merganser was not uncommon in the neighbourhood of Louisville during summer, and I told WILSON so. On several occasions I caught the young with a partridge net; and let me assure you, reader, that they are not yellow, as is alleged by some writers, but very dark brown. Even when feathered they retain the same colour until the beginning of August, when they gradually change it for the dress of the adult female.

Like all the rest of the tribe, which, when far north, for the want of hollow trees, breeds on the moss or ground, the Hooded Mergansers that remain with us nestle in the same kind of holes or hollows as the Wood

Duck; at least I have found their nests in such situations seven or eight times, although I never saw one of them alight on the branch of a tree, as the birds just mentioned are wont to do. They dive as it were directly into their wooden burrows, where, on a few dried weeds and feathers of different kinds, with a small quantity of down from the breast of the female, the eggs are deposited. They are from five to eight, measure one inch and three-fourths by one and three-eighths, and in other respects perfectly resemble those of the Red-breasted Merganser.

The young, like those of the Wood Duck, are conveyed to the water by their mother, who carries them gently in her bill; for the male takes no part in providing for his offspring, but abandons his mate as soon as incubation has commenced. The affectionate mother leads her young among the tall rank grasses which fill the shallow pools or the borders of creeks, and teaches them to procure snails, tadpoles, and insects. The eggs are laid in May, and the young are out some time in June. On two occasions the parents would not abandon the young, although I expected that the noises which I made would have induced them to do so; they both followed their offspring into the net which I had set for them. The young all died in two days, when I restored the old birds to liberty.

The Hooded Merganser, as well as all the other species with which I am acquainted, moves with ease on the ground, nay, even runs with speed. Those which leave the United States, take their departure from the first of March to the middle of May; and I am induced to believe that probably one-third of them tarry for the purpose of breeding on the margins of several of our great lakes. When migrating, they fly at a great height, in small loose flocks, without any regard to order. Their notes consist of a kind of rough grunt, variously modulated, but by no means musical, and resembling the syllables *croo, croo, crooh.* The female repeats it six or seven times in succession, when she sees her young in danger. The same noise is made by the male, either when courting on the water, or as he passes on wing near the hole where the female is laying one of her eggs.

The males do not acquire the full beauty of their plumage until the third spring, but resemble the females for the first year. In the course of the second, the crest becomes more developed, and the white and black markings about the head and body are more distinct. The third spring they are complete, such as you see the bird represented in the plate.

Dr. BACHMAN has favoured me with the following note respecting this species:—"On the 19th April, 1838, at the plantation of Major PORCHES, on the Santee river, in South Carolina, I obtained an old female Merganser and her five young ones, the latter apparently from two to three weeks old. They were in a very small pond, and could not be driven from it. As we

approached, the female sunk deep into the water, exhibiting only a very small portion of her back above the surface, and swimming with neck outstretched and low along the water. In endeavouring to drive the young to the high grounds, for the purpose of capturing them, they all dived in various directions, like Grebes. On conversing with an overseer, on the following day, he mentioned to me that he had on the previous week obtained several of the young in order to domesticate them, but having neglected to feed them on animal food they had all died. On the following day I met with two other broods, each of five, and was also shewn a cypress tree (*Cupressus disticha*) in the hollow of which a pair had been breeding during the present season. As far as I could learn, they breed in similar situations with the Summer Duck (*Anas Sponsa*), although generally a little earlier. They were all peculiarly marked with two white spots behind the wings on the back.

In an adult male, the width of the mouth is 7½ twelfths; the palate is flat, as is the anterior part of the roof of the mouth, on which are two longitudinal series of slender oblique lamellæ, besides the prominent tooth-like plates of the margins, of which there are 33 on the upper and about 40 on the lower mandible, on each side. Tongue 1½ inches long, and of the same form as in the other species. Œsophagus 7¼ inches long, 1 inch in width in the greater part of its extent, 1 inch 2 twelfths within the thorax. The stomach is a gizzard of moderate strength, 1½ inches long, 1⅛ inches in breadth; its lateral muscles large, being 7 twelfths in thickness; the epithelium dense, tough, and forming two flat grinding surfaces. The proventricular glands are very small, forming a belt 1¼ inches in breadth. The intestine is 51 inches long, its width from 3½ twelfths to 2¾ twelfths; the cœca 9 twelfths long, 2 twelfths wide, 3 inches from the extremity; the rectum 5 twelfths wide, forming at the end a globular cloaca, 1 inch in width. Lobes of the liver nearly equal, 2¼ inches in length; gall-bladder ½ inch long.

Trachea 6¼ inches long, much flattened, for 3 inches diminishing from 3½ twelfths to 2½ twelfths, then enlarging to 4½ twelfths; from this place to the tympanum it is of a trigonal form, with an acute carina anteriorly, and the rings are widely separated. There are 102 rings, besides 8 which are united and form part of the tympanum, which is of an irregular form, projecting anteriorly with a rounded bulge, and dilated on the left side, its greatest breadth 9 twelfths. The bronchi are of moderate length, the left with 32, the right with 26 half rings. The muscles as in the other species; the contractor muscles exceedingly large at the upper part.

Mergus cucullatus, Bonap. Syn., p. 397.

Hooded Merganser, *Mergus cucullatus*, Wils. Amer. Orn., vol. viii. p. 79.

MERGUS CUCULLATUS, *Hooded Merganser*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 463.

HOODED MERGANSER, Nutt. Man., vol. ii. p. 465.

HOODED MERGANSER, *Mergus cucullatus*, Aud. Orn. Biog., vol. iii. p. 246; vol. iv. p. 619.

Male, 19, 26. Female, 17½, 24.

Breeds sparingly in South Carolina, along the Mississippi, Ohio, and the Great Lakes, as well as farther northward. Abundant, during autumn and winter, on all the western and southern waters; rarer in the Middle Atlantic Districts.

Adult Male.

Bill about the length of the head, straight, somewhat cylindrical, deeper than broad at the base. Upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis curved, the ridge broad at the base, then convex, the sides sloping at the base, convex towards the end, the edges serrated beneath, with twenty-five tooth-like lamellæ directed backwards, the unguis oblong, much curved, rounded at the end. Nasal groove oblong, sub-basal, filled by a soft membrane; nostrils linear-elliptical, sub-medial, direct, pervious. Lower mandible with the angle very narrow and extended to the roundish unguis, the sides rounded, with a long narrow groove, the edges with about twenty-five lamellæ.

Head of moderate size, compressed, oblong. Neck rather short, body full and depressed. Wings small. Feet placed far behind, extremely short; tibia bare for a short space above the joint; tarsus extremely short, compressed, anteriorly covered with scutella, and another row on the lower half externally, the sides reticulate. Hind toe very small, with an inferior free membrane; anterior toes double the length of the tarsus; second shorter than fourth, which is nearly as long as the third, all connected by reticulated webs, of which the outer is deeply cut; the outer toe slightly margined, the inner with a broad marginal membrane. Claws short, considerably curved, compressed, acute, that of the middle toe with a thin inner edge.

Plumage on the upper parts strong and imbricated, on the lower blended and glossed; on the head and neck soft and blended, the feathers of the upper part of the head elongated and capable of being erected into a long compressed rounded crest, those of the shoulders very broad and elongated. Wings very short, small, curved, and pointed; primaries narrow, tapering, the first scarcely shorter than second, the rest rapidly graduated; secondaries short, narrow, rounded, the inner elongated and tapering. Tail short, graduated, of sixteen rounded feathers.

Bill black. Iris yellow. Feet yellowish-brown; claws dusky. Upper part of the head, back, smaller wing-coverts, quills and tail, brownish-black; sides of the head, upper half of the neck all round, the broad extremities of

the large feathers on the shoulders, the scapulars, inner secondaries, and larger wing-coverts, greenish-black. A broad patch of white behind the eye, very conspicuous in the erected crest. Lower part of neck and breast also white, as are the speculum and the central part of the inner secondaries. Sides beautifully marked with undulated transverse lines of yellowish-brown and brownish-black; lower tail-coverts whitish, similarly undulated.

Length to end of tail 19 inches, to end of wings 16¾, to end of claws 18; extent of wings 26; wing from flexure 7½; tail 4; bill along the ridge 1$\frac{11}{12}$, along the edge of lower mandible 1⅝; tarsus 1¼, middle toe 1$\frac{21}{12}$, its claw ¼. Weight 1 lb. 7 oz.

Adult Female.

The female is much smaller than the male. The crest is smaller and of a looser texture; the feathers of the shoulders not so large; those of the sides shorter and more compact. The bill is brownish-black towards the end and along the ridge, orange towards the base. The upper part of the head, including the crest, yellowish-brown; chin whitish, upper part of neck and sides of the head greyish-brown. The general colour of the back, upper surface of wings, tail, and sides, is blackish-brown, the feathers edged with paler, the edgings of the fore part of the back and shoulders larger and pale greyish-brown; speculum greyish-white; breast and abdomen pale yellowish-brown.

Length to end of tail 17½ inches, to end of claws 16½; extent of wings 24. Weight 1 lb.

The young resemble the female. The young males after their first moult still resemble the female, but have the speculum and lower parts pure white.

WHITE MERGANSER.—SMEW, OR WHITE NUN.

MERGUS ALBELLUS, *Linn.*

PLATE CCCCXIV.—MALE AND FEMALE.

The Smew is a bird of extremely rare occurrence in the United States, insomuch that it must be considered merely as a transient or accidental visiter. Indeed, I have felt strong misgivings on reading WILSON'S article on this species, and cannot but think that he is mistaken when he states that it "is much more common on the coast of New England than farther south;" and again "in the ponds of New England, and some of the lakes in the State of New York, where the Smew is frequently observed—." Now, although I have made diligent inquiry, not only in New England, but in every part of our country where I thought it likely that the Smew might occur, I have not met with any person well acquainted with birds of this family, who has seen it. WILSON, in short, was in all probability misinformed, and it is my opinion that his figure was made from a stuffed European specimen which was then in Peale's Museum in Philadelphia, and that he had taken the Buffel-headed Duck, seen at a distance, for this species, as I am aware, has been the case with other individuals.

The only specimen procured by me was shot by myself on Lake Barataria, not far from New Orleans, in the winter of 1819. It was an adult female in fine plumage. How it had wandered so far south is an enigma to me; but having found it, and made a drawing of it on the spot, I have taken the liberty to add one of the other sex from an equally fine specimen. After all, the Smew can scarcely be considered as belonging to the American Fauna, any more than our Fork-tailed Hawk can with propriety be called a denizen of England; and in this I am supported by all the great navigators of our Arctic Seas, such as ROSS, PARRY, and FRANKLIN, none of whom, nor any of their companions, ever met with a single individual of this beautiful bird.

SMEW OR WHITE NUN, *Mergus Albellus*, Wils. Amer. Orn., vol. viii. p. 126.
MERGUS ALBELLUS, Bonap. Syn., p. 398.
SMEW OR WHITE NUN, Nutt. Man., vol. ii. p. 467.
SMEW OR WHITE NUN, *Mergus Albellus*, Aud. Orn. Biog., vol. iv. p. 350.

Male, 17½, 27. Female. 15½, 25.

2

White Merganser. Smew. White Nun.

1 Male 2 Female

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. Lith.d Printed & Col.d by J.T. Bowen Philad.a

Exceedingly rare in America, one specimen only having been procured at New Orleans.

Adult Male.

Bill rather shorter than the head, straight, rather slender, a little higher than broad at the base, tapering, somewhat cylindrical toward the end. Upper mandible with the dorsal outline sloping gently and slightly concave to the middle, then straight, at the tip decurved, the ridge rather broad and flat at the base, then convex, the sides sloping at the base, convex toward the end, the edges serrate beneath, with about forty slightly reversed, compressed, tapering, tooth-like lamellæ, the unguis elliptical, much curved. Nasal groove oblong, sub-basal, filled by a soft membrane; nostrils oblong, sub-medial, direct, pervious. Lower mandible with the angle very narrow and extended to the obovate, very convex unguis, the sides rounded, with a long groove, the edges with about sixty perpendicular sharp lamellæ.

Head of moderate size, oblong, compressed. Neck of moderate length. Body full and depressed. Feet placed far behind, extremely short; tibia bare for a quarter of an inch; tarsus extremely short, much compressed, anteriorly covered with a series of very small scutella, and another row on the lower half externally, the sides reticulate. Hind toe very small, with an inferior free membrane; anterior toes double the length of the tarsus; the second shorter than the fourth, which is nearly as long as the third; all connected by reticulated webs, of which the outer is deeply emarginate. Claws short, considerably curved, compressed, acute, that of the middle toe with a thin inner edge.

Plumage full, soft, and blended; feathers of the head and upper part of the hind neck very slender, and elongated along the median line into a narrow decurved crest; those of the shoulders obovate and abrupt, of the rest of the upper parts ovate, of the lower elliptical. Wings very short, narrow, curved, and pointed; primaries narrow, tapering, the first scarcely longer than the second, the rest rapidly graduated; secondaries short, narrow, rounded, the inner tapering to an obtuse point. Tail short, graduated, of sixteen rather narrow, tapering feathers.

Bill dark greyish-blue. Iris bright red. Feet livid blue, claws dusky. The general colour of the plumage is pure white; a short band on each side of the hind neck bordering the crest, duck-green; a broad patch on the lore and below the eye, a narrow band across the lower part of the hind neck, formed by single bars near the tips of the feathers, the middle of the back in its whole length, a short transverse bar under the fore edge of the wing, the anterior margin of that organ to beyond the carpal joint, the outer edges of the scapulars, the primary coverts, the secondary coverts, and the outer secondary quills, exeepting the tips of both, deep black. The quills are also

black, but of a less deep tint; the hind part of the back becomes tinged with grey, and the rump and tail-feathers are dusky grey. The sides of the body and rump are white, finely undulated with blackish-grey.

Length to end of tail 17½ inches, to end of claws 18¼, to end of wings 15½; extent of wings 27; bill along the ridge 1$\frac{3}{12}$, along the edge of lower mandible 1$\frac{7}{12}$; wing from flexure 7$\frac{3}{4}$; tail 3½; tarsus 1$\frac{1}{12}$; first toe ½, its claw $\frac{2}{12}$; second toe 1½, its claw $\frac{4}{12}$; third toe 1$\frac{1}{12}$, its claw $\frac{4}{12}$; fourth toe 1$\frac{9}{12}$, its claw $\frac{3}{12}$. Weight 1 lb. 8 oz.

Adult Female.

The female is much smaller. The feathers of the hind part of the head and neck are also elongated so as to form a crest. The bill, iris, and feet, are coloured as in the male. All the lower parts are white, excepting a broad band of light grey across the middle of the neck, and a narrow portion of the sides, which are of a deeper tint. There is a patch of brownish-black on the lore and beneath the eye; the upper part of the head and half of the hind neck are light reddish-brown; the rest of the hind neck, and all the upper parts, bluish-grey, darker behind, and in the middle of the back approaching to black. The wings as in the male, that is black, with a large patch of white, and two narrow transverse bands of the same; the tail dusky grey.

Length to end of tail 15¾ inches, to end of claws 16¼, to end of wings 14½; extent of wings 25. Weight 1 lb. 4 oz.

FAMILY XLI.—PELECANINÆ. PELICANS.

Bill longer than the head, rather slender, straight, upper mandible with the ridge separated from the side by a groove, and terminated by a narrow, generally decurved, pointed unguis; lower mandible with the crura elastic and extensile, the angle very long and narrow. Nostrils basal, lateral, linear, small, or obsolete. Space around and before the eye generally bare, as is a portion of the gular sac. Head generally of moderate size, but various; neck long; body elongated, rather slender. Feet short and stout; tibia bare at its lower parts; tarsus short, very stout, compressed, scaly or scutellate in front; toes four, all connected by webs, and scutellate; first small, fourth longest. Claws short, strong, curved, rather blunt, that of the third toe generally pectinate. Plumage soft, blended, on the back compact and imbricated. Wings long; tail of moderate length, narrow, rounded or tapering. Tongue extremely small, triangular, fleshy; œsophagus excessively wide; a gular sac, sometimes of enormous capacity; proventricular belt generally discontinuous; stomach very small, slightly muscular, epithelium smooth; a globular pyloric lobe; intestine very long and slender; cœca small, cylindrical; cloaca globular. Trachea simple, flattened; no inferior laryngeal muscles.

Genus I.—PHALACROCORAX, *Briss.* CORMORANT.

Bill about the length of the head, rather slender, nearly straight, compressed toward the end; upper mandible with the dorsal line concave, until on the unguis, where it is decurved, the ridge convex, flattened toward the end, separated from the sides by a narrow groove, the sides convex, the edge sharp and nearly straight as far as the unguis, which is decurved, convex above, acute, its tip ascending far beyond that of the lower; lower mandible with the angle long and very narrow towards the end, filled up by an extensile membrane, which extends to the level of the angle of the mouth; the outline of the crura very slightly convex, that of the terminal part descending and very slightly convex, the sides convex, the edges sharp and inflected, the tip compressed, with its marginal outline decurved. Nostrils obliterated (in youth open). Head rather small, oblong; neck long and

rather thick; body full, elongated, depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much depressed, covered all round with angular scales; a series on part of the inner side anteriorly, and another on the lower part of the outer, scutelliform. Toes all placed in the same plane, connected by webs, and covered above by very numerous oblique scutella; first the smallest, fourth the longest. Claws rather small, strong, compressed, acute, convex above, arched, that of the third toe pectinated on its inner edge. Plumage soft, generally blended, compact on the back and wings; the small gular sac, and the space before and beneath the eye, with the eyelids, bare. Wings of moderate size, broad; primaries curved, pointed, the second longest. Tail of moderate length, very narrow, much rounded, of twelve or more narrow strong-shafted feathers. Gular sac small; tongue extremely small; œsophagus very wide; proventricular glands disposed in two large roundish masses; stomach small, slightly muscular, inner coat smooth and soft; a globular or triangular pyloric lobe; duodenum at first curving upwards; intestine very long, and of moderate width; cœca small; rectum narrow; cloaca globular. Trachea considerably flattened; bronchi of moderate width.

THE COMMON CORMORANT.

PHALACROCORAX CARBO, *Linn.*

PLATE CCCCXV.—MALE, FEMALE, AND YOUNG.

Look at the birds before you, and mark the affectionate glance of the mother, as she stands beside her beloved younglings! I wish you could have witnessed the actions of such groups as I did while in Labrador. Methinks I still see the high rolling billows of the St. Lawrence breaking in foaming masses against the huge cliffs, on the shelves of which the Cormorant places its nest. I lie flat on the edge of the precipice some hundred feet above the turbulent waters, and now crawling along with all care, I find myself only a few yards above the spot on which the parent bird and her young are fondling each other, quite unconscious of my being near. How delighted I am to witness their affectionate gratulations, hear their lisping

Common Cormorant

Drawn from Nature by J.J.Audubon FRSFLS.

1. Male 2. Female 3 Young.

Lith.d Printed & Col.d by J. T. Bowen Phila.a

notes, mark the tremulous motions of their expanded throats, and the curious vacillations of their heads and necks! The kind mother gently caresses each alternately with her bill; the little ones draw nearer to her, and, as if anxious to evince their gratitude, rub their heads against hers. How pleasing all this is to me! But at this moment the mother accidentally looks upward, her keen eye has met mine, she utters a croak, spreads her sable wings, and in terror launches into the air, leaving her brood at my mercy. Far and near, above and beneath me, the anxious parent passes and repasses; her flight is now unnatural, and she seems crippled, for she would fain perform those actions in the air, which other birds perform on the ground or on the water, in such distressing moments of anxiety for the fate of their beloved young. Her many neighbours, all as suspicious as herself, well understand the meaning of her mode of flight, and one after another take to wing, so that the air is in a manner blackened with them. Some fly far over the waters, others glide along the face of the bold rock, but none that have observed me realight, and how many of those there are I am pretty certain, as the greater number follow in the track of the one most concerned. Meanwhile the little ones, in their great alarm, have crawled into a recess, and there they are huddled together. I have witnessed their pleasures and their terrors, and now, crawling backwards, I leave them to resume their ordinary state of peaceful security.

It was on the 3d of July, 1833, about three in the morning, that I had the pleasure of witnessing the scene described above. I was aware before that a colony of Cormorants had nested on the ledges of the great rocky wall that separated our harbour of Whapatiguan from the waters of the Gulf of St. Lawrence. A strong gale had ruffled the sea, and the waves dashed with extreme violence against the rocks, to which circumstance, I believe, was owing my having remained awhile unseen and unheard so near the birds, which were not more than four or five yards below me. The mother fondled and nursed her young with all possible tenderness, disgorged some food into the mouth of each, and coaxed them with her bill and wings. The little ones seemed very happy, billed with their mother, and caressed her about the breast. When the parent bird flew off on observing me, the young seemed quite frightened, squatted at once on their broad nest, and then crawled with the aid of their bills until they reached a recess, where they remained concealed.

On another occasion, my young friends LINCOLN and COOLEDGE, along with my son, went to the same rocks, for the purpose of bringing me a nest and some of the young Cormorants. They reported that, in one instance, they surprised the parent birds close beneath them, apparently asleep, resting on their rumps in an upright position, with the head thrust under the wing,

and that, had they had a noose attached to their poles, they might have secured at least one of them, but that after a few minutes one drew out her head, stretched her neck, and after looking around flew off croaking, so as to alarm all her neighbours.

We saw no nests of this species placed in any other situations than the highest shelves of the precipitous rocks fronting the water and having a southern exposure. No other Cormorants bred on the spots of which this kind had taken possession; but Ravens and Peregrine Falcons were observed to have nests on the same rocks, and in some instances close to them. The nests were formed of a quantity of small dry sticks, matted in a rude manner with a large quantity of weeds and moss, to a thickness of four or five inches in new nests, and in others to that of a foot or more; for we observed that this species, as well as the Double-crested and the Florida Cormorants, repair and enlarge their tenements each season, and return to the same rocks many years in succession, as was shewn by their places of resort remaining white-washed with excrements through the winter, in which condition we saw them previous to the arrival of the birds that season. The nests varied in breadth according to the space on which they were placed; where there was ample room, they measured at the base from thirty to thirty-six inches in diameter; others were scarcely large enough to hold the young, which nevertheless seemed as contented as their neighbours. On some shelves, eight or ten yards in extent, the nests were crowded together; but more usually they were placed apart on every secure place without any order; none, however, were below a certain height on the rocks, nor were there any on the summit. The nests being covered with filth, were offensive to the eye, and still more so to the nose. The eggs, three or four in number, more frequently the former, average two inches and five-eighths in length, by one inch and three-quarters in breadth, the shell of a uniform pale bluish-green colour, mostly coated over with calcareous matter.

The young are at first of a dark purplish livid colour, and have a very uncouth appearance, their legs and feet seeming enormous. In less than a fortnight they become covered on all the upper parts with brownish-black down, but the abdomen remains bare much longer than the rest. They increase rapidly in size, and are fledged in six or seven weeks. Some that were weighed when about a month old, averaged three pounds, and others almost able to fly six pounds, the young of this species, as of most water birds, being much heavier than the parent at the time of leaving the nest. We procured several of different sizes, which we kept on the deck. Whenever a person approached them, they raised their heads, stretched their necks, and opened their bills, so as to expand the skin of the throat, which they made to vibrate, while they uttered a sort of hissing mutter of a very strange

character, but resembling that of the young of the Brown Pelican. They crawled sluggishly about, aiding themselves in their progress with their bills, and at all times looked extremely clumsy. They took food very readily, ate a prodigious quantity, certainly more than their own weight each day, and appeared always ready to receive more. When thrown overboard, they swam off under water, like the old birds, with considerable speed, moving their unfledged wings all the while. Some would not rise for twenty or thirty yards, but few went farther under water than that distance, and they were soon fatigued. On one occasion, some half-grown young birds threw themselves from their nest, or were pushed off by their parents while in the agonies of death, they having been shot at. As they passed quickly downwards through the air, they moved their wings with great rapidity, and the instant they reached the water they disappeared beneath the surface.

This Cormorant swims at times with astonishing speed, keeping itself deeply immersed. Now and then, should it apprehend danger, it sinks so far as to shew only the head and neck, in the manner of the Anhinga. When searching for food in clear shallow water, they frequently swim with the rump rather elevated, and the head under, in the manner of the Shoveller Duck on such occasions, as if they were looking for prey on the bottom ; but I never observed them act thus when the depth of water exceeded a few yards. They secure their prey by diving and pursuing it under water, with the wings partially extended and employed as paddles, while the tail directs their course, and checks or accelerates their speed. I have observed this in the Florida Cormorant, as well as in the present species. I never saw one while flying plunge after its prey ; but I have repeatedly seen them drop from a rock, headlong into the sea when shot at for the purpose of observing their actions.

Cormorants, Pelicans, Ducks, and other water birds of various kinds, are, like land birds, at times infected with insects which lodge near the roots of their feathers ; and to clear themselves of this vermin, they beat up the water about them by flapping their wings, their feathers being all the time ruffled up, and rub or scratch themselves with their feet and claws, much in the same manner as Turkeys and most land birds act, when scattering up the dry warm earth or sand over them. The water birds after thus cleansing themselves remove, if perchers, and able to fly, to the branches of trees, spread out their wings and tail in the sun, and after awhile dress their plumage. Those which are not perchers, or whose wings are too wet, swim to the shores, or to such banks or rocks as are above water, and there perform the same process. The Florida Cormorant is especially addicted to this practice, and dives and plumes itself several times in the day. The Double-crested and the present species, which inhabit colder regions, seem to be

satisfied with less frequent trimming, and go through the operation only once a-day, at the warmest period. I never observed any of these birds in their natural free state perform these actions in rainy or even cloudy weather, but have frequently seen Cormorants in a state of captivity do so on small artificial ponds, such as those of the London Zoological Gardens.

When they have landed after cleansing themselves by washing, they usually extend their wings, and flap them for awhile, in the manner of young birds of any kind when trying the strength of their wings before leaving the nest. They are extremely regular in returning to the same places to roost, at the approach of night, when hundreds appear to congregate on their way there, as they pass over the different fishing grounds. Those that have no broods, spend the night apart from the rest, standing nearly erect in files on the most elevated shelves, to which they ascend in the manner of some Hawks, when about to perch on any elevated spot. In winter, however, I observed some near Boston roosting singly, and immediately over their fishing places, which are usually the eddies under the projecting points of rocky islands. They are shy and wary at all periods; but when congregated in the day, it is almost impossible to approach them while fishing, for they dive and return to the surface one after another, so that one or more are constantly on the watch, and act as sentinels. It is in general quite useless to pursue one that has been wounded.

The flight of this species is strong, swift, and remarkably sustained. They usually fly in long strings, now and then forming angles, at a moderate elevation in the air. When on the rocks, they stand erect on their rump, with the neck gracefully curved, and resting between the shoulders. You may see them in hundreds, when they look like a crowd of black dominoes. If alarmed, they extend their neck to its full length, and move their head sideways to observe your motions; and if you approach them, they gradually raise and extend their wings, elevate the tail, incline the body forwards, and fly off in silence.

All our Cormorants feed principally on fish of various kinds. When they have seized one that is too large to be swallowed entire, they carry it to the shore, or to the branch of a tree, and there thrash and tear it to pieces. Some fishes which they have swallowed evidently incommode them, and on such occasions I have sometimes seen them shake their heads with great violence, and disgorge the fish, or pass it downwards into the stomach. The young ones which we kept several weeks at Labrador, performed both actions, but generally the first. All the species are expert at tossing up a fish inconveniently caught, a foot or so above their head, and receiving it in their extended gullet, in the same manner as the Frigate Pelican. Some which I have observed in a domesticated state, were so expert at receiving a

fish thrown to them from the distance of several yards, by a sudden and precise movement of the neck and head, as seldom to miss one in a dozen.

The courtship of this species is so similar to that of the Florida Cormorant, that I consider it unnecessary to describe it, as I should merely repeat what is said with respect to that species. I have seen them act in the same manner, both on the shelves on which the nests were placed, and on the water. They begin to lay about the first of June, on the islands near the Bay of Fundy, about a fortnight later in Labrador; and it is my opinion that the younger birds spend their breeding season in the former places.

The Common Cormorant walks in a waddling and awkward manner, but at a good pace, and leaps from one stone to another, assisting itself with its wings, and occasionally with the tail, which acts as a kind of spring. I am unable to say at what age this species attains the full dress of the love season, but it cannot be in less than three years, as some which I have known to have been kept in a state of constant captivity, did not shew the white patch on the thigh, nor the slender white feathers around the head and part of the neck, until the middle of May, in the fifth year. That the younger birds of this and other Cormorants, breed before they have acquired the full beauty of their plumage, is a fact which I have had many opportunities of ascertaining. The Common Cormorant is found breeding, both near the entrance of the Bay of Fundy, and along the coast of Labrador, in flocks of fifty or more pairs, of which not an individual shews any white unless on the sides of the head, and along the throat, but much duller on these parts than even in the female represented in the plate, which was yet what may be termed an immature bird. No differences appear in the garb of the sexes, in their different states of plumage, and perfect specimens of both are equally beautiful in the breeding season, being then similar to the male of which I have endeavoured to present a good portrait. I have observed a greater difference in size between individuals of this species, and those of any other.

The white markings observed on the old birds of this species, during the period of courtship, incubation, and rearing of the young until they are able to fly, and which extends to two months and a half, begin to disappear from the moment incubation has fairly begun, and at the time when the young leave the nest scarcely any remain, unless on the sides of the head. In autumn and winter the feathers of the head are similar to those of the neck, and the plumage in general has lost much of its vernal and æstival beauty. The entire crest also falls off in autumn. The white markings and the crest are renewed in the wild state about the end of February; but in birds kept in domestication rarely before May. The young do not exhibit the crest until the second spring, at which period, being yet destitute of white

markings on the head and thighs, they might readily be mistaken for a different species, by a person unacquainted with their habits.

The singular fact that the young of some species of Cormorant have *open nostrils* until they are nearly half-grown, may surprise you as much as it surprised me. Having observed it in many individuals, I preserved one in spirits, and of it you will find a description beneath.

The Common Cormorant is rarely seen farther south than the extreme limits of Maryland; but from Chesapeake Bay eastward, it becomes more plentiful; and in severe winters, I have seen it exposed for sale in the New York market. They are abundant in winter around the islands of the Bay of Boston, and on the coasts of Massachusetts and Maine, where most of them remain during autumn, winter, and the early part of spring, as well as on the Bay of Fundy and along the shores of Nova Scotia. I am unable to say how far north they go beyond Labrador, to breed, or what may be the limits of their range on the St. Lawrence in autumn. I have never seen one on a tree, or on fresh water. The flesh of this species is dark, tough, and fishy, its eggs also do not furnish agreeable food, and it is seldom that either are eaten, even by epicures.

PHALACROCORAX CARBO, Bonap. Syn., p. 402.
CORMORANT, Nutt. Man., vol. ii. p. 479.
COMMON CORMORANT, *Phalacrocorax Carbo*, Aud. Orn. Biog., vol. iii. p. 458.

Male, 37, 62.

Ranges during winter southward to New York. Abundant from Massachusetts eastward. Breeds on high precipitous rocks, in Newfoundland, Labrador, and Baffin's Bay. Migratory.

Adult Male in March.

Bill about the length of the head, rather slender, somewhat compressed, straight, with the tip curved. Upper mandible with the dorsal line sloping and slightly concave, at the tip decurved, its ridge broad and rounded, and separated from the sides by a narrow groove, the sides erect, irregularly scaly, convex, the edges sharp and straight as far as the unguis, at the base a distinct horny plate, the unguis strong, convex above, incurved, acute. No external nostrils when full-grown. Lower mandible with the angle long and very narrow towards the end, filled by an extensible membrane, which extends a short way down the throat, its short dorsal line a little convex, then concave, the sides scaly, erect, and slightly convex, the edges sharp and inflected, the tip compressed and obliquely truncate.

Head rather large, oblong, narrowed before. Neck long and stout. Body rather full, depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all

round with scales, of which the outer are sub-hexagonal, the inner transversely elongated, the posterior very small and roundish. Toes all placed in the same plane, and connected by reticulated webs, covered above with very numerous oblique scutella; first toe smallest, fourth longest. Claws strong, curved, compressed, acute, that of the third toe pectinated on its inner edge.

Plumage of the head, neck, lower parts, and posterior portion of the back, glossy, blended, and silky; of the fore part of the back and wings compact, the feathers with loose glossy margins. The middle feathers of the occiput and hind neck are elongated, and those of the head and upper neck are intermixed with numerous linear feathers of a different colour, and erectile at will. Space around the eye, and to a large extent along the base of the bill, together with the small gular sac, bare. Wings rather small; primaries very strong, curved, rather narrow, tapering and obtuse, third longest, second almost as long, first little shorter; secondaries decurved, broad, broadly rounded, the inner broad and shorter. Tail small, much rounded, of fourteen narrow, rounded feathers, having extremely long shafts.

Upper mandible greyish-black, along the edges yellowish-white; lower yellowish-white at the base, dusky towards the end. Iris light bluish-green, margins of eyelids dusky. Bare space about the eye dull olive, below it bright red, the gular sac yellow. Feet and claws greyish-black. All the silky part of the plumage is black, glossed with deep greenish-blue; at the base of the gular sac is a broad gorgelet of white, and the linear interspersed feathers over the head and upper neck are white, there is also a large parcel of elongated white feathers on the side over the thigh. The feathers of the wings and part of the back are dull bluish-grey glossed with bronze, their fringe-like margins greenish-black. Primary quills greyish-black, secondary like the other feathers of the wing. Tail greyish-black. The shafts of all the feathers are black at the end, leaden-grey towards the base.

Length to end of tail 37 inches, to end of claws 36; to end of wings 32; extent of wings 62; wing from flexure 14; tail 6½; bill along the ridge $3\frac{5}{12}$, along the edge of lower mandible $4\frac{3}{12}$; tarsus 2¾; outer toe $3\frac{7}{12}$, its claw $\frac{11}{12}$. Weight 7½ lbs.

Female in July.

The female when old is similar to the male. In the state here represented, the plumage in general is similar, but the white feathers of the head and thighs are wanting. The bill, eyes, and feet are coloured as in the male, as are the bare parts about the base of the bill, only the part under the eye which is bright red in the male, is bright yellow in the female.

Young birds unfledged.

The inside of the mouth and the gular sac flesh-coloured; the bill dusky,

at the base flesh-coloured; the eyes bluish-grey. The general colour of their skin is dull livid; the feet purplish-dusky, the webs yellowish-brown.

The following is a description of the smaller individual represented in the plate, and which was about two weeks old. The length is twelve inches and a half; the colour dull livid, the abdomen and breast lighter, the forehead, gular sac, and bases of the mandibles, flesh-colour, tinged with yellow, as is the mouth. The head and upper part of the neck are bare, as well as the lower surface of the wings. Over the rest of the body are small down tufts rising in regular series, excepting along an impressed line extending from the anterior part of the thorax to the anus. The apertures of the ears are round, extremely small, being only half a twelfth in diameter; the eyes very small, the iris grey. The aperture of the posterior nares is linear-lanceolate, smooth on the edges, half an inch long. A probe introduced into it passes readily out by the nostril, which is basal, linear, small, two-twelfths long, placed at the commencement of the long groove which separates the sides from the ridge of the mandible, and covered above by the skin, so as to be not readily observed, although it is easily dilatable. Each internal nostril is oblique, much wider below, and has on its inner side a transverse soft ridge, which divides it into two cavities, the posterior deep and funnel-shaped, passing backwards and upwards, the anterior becoming narrower towards the external aperture. The tongue is extremely small, four-twelfths long, elliptical, with a central ridge. The œsophagus is extremely dilatable, and as far as the middle of the neck is of larger diameter than below, but it again dilates as it enters the stomach. Its length is five inches and a half. The inner coat is smooth in its dilated part, but in the rest is raised into numerous longitudinal ridges or folds, which at the lower part are undulated. The stomach is oblong, four and a half inches long, quite membranous, and without apparent central tendons. The gastric glands are disposed so as to occupy two spaces, the one three and a half inches by two, the other a little smaller. The inner coat is soft and without wrinkles. The intestine is five feet two inches long, at its upper part three-twelfths in diameter, gradually diminishing to one-twelfth. At the distance of two inches from the anus are two cœca, three-twelfths long, one-twelfth in diameter, and rounded. The contents of the stomach were fragments of fish, with numerous bones, and a pebble about half an inch in diameter. The heart triangular, much flattened. The liver of two very unequal lobes, the right one two inches and a half long, the other one and a half. The specimen, which I had preserved in spirits, was examined in my presence by my friend Mr. MACGILLIVRAY. Whether the fact of the anterior aperture of the organ of smell being open in the young Cormorant has been observed by any other person than myself, I know not; but it would seem that the general opinion is, that Cormorants

have no external nares in any stage, and although some state that in the adult they exist, and are extremely small, others allege that there are none at all.

A young female, shot in the end of October, on being carefully examined, was found to present the following characters.

The length to the end of the tail was 36 inches, to the end of the wings 29¾, to the end of the outer toe 34½; the extent of the wings 55; the weight 5 lbs. 10½ oz.

Bill along the ridge and unguis black, the sides brownish-grey; the lower mandible brownish-grey, dusky on the sides at the middle, the bare skin at the base yellow, as is the gular sac. Upper part of the head and hind neck brownish-black; the back greenish-black, its fore part, the scapulars and the wing-coverts brownish-grey, the feathers edged with greenish-black, and an outer margin of brownish-white, most conspicuous on the secondary coverts; the quills brownish-black, the secondaries tinged with grey on the outer edge; the tail greyish-black, the shafts greyish-blue. Upper part of the throat brownish-white; the rest of the neck greyish-white, mixed with brown; the breast and abdomen white, the sides greenish-black; the lower surface of the wings dusky; the lower tail-coverts greyish-brown, the feathers before them brownish-black. The feet greyish-black; the inner edge of the middle claws very slightly pectinated. The foot, when stretched to its full extent, measures, from the tip of the first to that of the fourth claw, $5\frac{10}{12}$ inches.

The tongue is oblong, carinate above, $\frac{7}{12}$ long, $\frac{3}{12}$ broad. The palatal slit or aperture of the posterior nares is linear, $1\frac{2}{12}$ long, with a soft flap on each side. The mouth is $1\frac{5}{12}$ wide; the bill 3¼ along the back, 4 along the edge of lower mandible. The aperture of the ear is circular, only half a line in diameter.

On blowing into the posterior nares no air passes. The internal cavities are separated by a longitudinal membranous dissepiment; each cavity is transversely divided by a membranous partition, but neither of the chambers thus formed has any external communication by the mandible. The lachrymal duct, which is wide, passes obliquely forward and downward into the anterior cavity. On gradually slicing the horny covering of the mandible over the place where the nostril ought to be, its position is found clearly defined, there being a slight discontinuity of the bone at that part; but on cutting farther all traces disappear, the original aperture being closed by ossification.

The aperture of the glottis has thick prominent rounded edges, which unite behind and terminate in three knobs, and there is a small transverse flap on each side behind.

The heart is triangular, depressed, obtuse, 2½ inches long, its greatest breadth 1 7/12. The liver has two very unequal lobes, the right 5 inches, the left 3 inches long; the former 2½ broad, the latter 1¾. The gall-bladder is 2¼ long, 3/12 in diameter, rounded, but not much enlarged at the extremity.

The œsophagus is 22½ inches long; at its upper part when dilated upwards of two inches wide, extremely thin, its circular fibres distinct. It is contracted in the whole length of the thorax, where its smallest diameter is 3/12, the largest 4/12; but this part, which in the ordinary state has its inner coat folded into numerous longitudinal wrinkles, is capable of being dilated so as to present a diameter of more than 3 inches, when the internal rugæ disappear. The proventriculus seems at first to form part of the stomach; its walls are extremely thick and studded with glandules, disposed in two circular patches, which are separated by a space of about 3/12 of an inch. The stomach properly so called is very small; its muscular coat thin, but with two distinct tendons. It is of an oblong form, compressed, and at its upper parts has a rounded lobe, from which the intestine comes off. The inner coat is thick, soft, and rugous. The pylorus has a circular marginal rim. The intestine, which is 8 feet long, is at its upper part 3/12 in diameter, towards the cœca 2½. The rectum is 7 inches long, its diameter for 4½ inches is 7/12; the cloaca globular, 2 2/12 in diameter; the cœca 3/12 long. The cystic duct enters one inch below the hepatic; between them enters one of the pancreatic ducts, the other 2 inches farther up. The distance from the pylorus to the hepatic duct is 16½ inches.

The lungs extend to the kidneys. The ovules exceedingly small and numerous. In the proventriculus and lower part of the œsophagus were many small ascarides. The contents of the stomach were a few bones of fishes.

Although I have not actually observed that Cormorants have the power of disgorging such substances as they are unable to digest, I should not be surprised to find this to be the case, when their habits are investigated in a state of domestication.

Double crested Cormorant.

Male.

Drawn from Nature by J.J. Audubon FRSFLS. Lith. Printed & Col.d by J.T. Bowen, Phila.a

THE DOUBLE-CRESTED CORMORANT.

PHALACROCORAX DILOPHUS, *Swains.*

PLATE CCCCXVI.—MALE.

The objects that more especially attract the notice of the voyager, as he draws near the south-west coast of Labrador, are the numerous low islands covered with countless multitudes of birds, that have assembled there for the purpose of reproduction. Some miles farther, you see a ridge of craggy and desolate cliffs, emerging from the sea, and presenting the appearance of a huge granite wall. This forms a partition between the waters of the great St. Lawrence and many fine harbours hidden here and there behind it, along with numerous inlets and bays, coves and small creeks, in which the bark of the adventurer may ride in comparative safety. From the hoary summit of this bulwark the view is grand beyond description; valleys richly carpeted with moss and thickets of low shrubs glow in tints of the richest green; clear blue lakes bear on their bosom numerous birds of varied wing, while around their margins the females are seated on their eggs or carefully leading about their young; banks of perennial snow arrest your eye for a moment, and perhaps produce an involuntary chill; onward towards the horizon, mountains heaped confusedly behind mountains, mingle their gloomy tints with those of the cold sky. In that land, man may for weeks, even months, seek for his kind in vain. The deep silence that reigns around him during a calm, seldom fails to bring sadness to his heart, as his eye grows dim with gazing on the wilderness. Should the northern gale issue from its snowy chambers, darkness follows in its train, and should its whole fury pour upon you, melancholy indeed must be your lot.

To the low islands above alluded to, the beautiful Cormorant represented in the plate before you, resorts each spring, for the purpose of breeding. It arrives from the south about the beginning of May, or as soon as the waters of the Gulf are sufficiently free of ice to enable it to procure food. The winter it spends on our eastern coasts, but it rarely proceeds farther south than the Capes of North Carolina, about which it meets its southern friend the Florida Cormorant, on whose dominions, however, it does not venture.

While with us, the Double-crested Cormorants are seen flying in long lines, sometimes forming angles, and passing low over the water, at no great

distance from the shore. They enter our large bays, rivers and creeks, going up as far as the tide, but are seldom or never seen fishing in fresh-water. Their stay along the Middle Districts continues from the beginning of October to the middle of April; farther east they are seen a month earlier, and disappear a fortnight later. A good number breed on the Seal Islands off the Bay of Fundy, but the greater part return to Labrador and Baffin's Bay, where Dr. RICHARDSON found this species. To that excellent man and intrepid traveller, we are indebted, among other valuable fruits of his labours, for the first good description of this bird. From his account and the information which I have received from Captain JAMES CLARK ROSS, I believe that it does not go much farther north than the place where it was observed by the first mentioned traveller; and no Cormorants were seen during the late voyage to the Arctic circle. It is probable that neither the Double-crested nor the Florida Cormorants occur in any part of Europe; at least, if they have been described as birds of that quarter of the globe, I can find no account sufficiently correct to enable me to recognise them.

A few miles from one of the entrances of the Harbour of Whapatiguan, is a low and flat island about a mile in length, on which the present species breeds. As we sailed past it, we could easily observe the birds on their nests, all over the rock, which was completely white-washed with their excrement, that emitted a disagreeable odour to a great distance. I had seen several islands near the Harbour of Great Macatina inhabited by these Cormorants, but being anxious to complete the examination of one subject at a time, and knowing that we should see a greater number as we approached the Straits of Belle Isle, I put off the investigation until I should have leisure to prosecute it satisfactorily.

My son, accompanied by the captain and four sailors, sailed for Cormorant Island, on which, however, they found great difficulty in landing, for the surf broke so fearfully as to call into requisition all the judgment and good management of Mr. EMERY. The moment they landed, almost all the birds of the island rose on wing, darkening the air, and alighted at some distance on the water in large bodies. They were so shy that it was not without considerable difficulty that ten of them were obtained. At the first shot, hundreds of young ones scrambled out of their nests, and huddled together in packs of fifteen or twenty. When the men approached them, they opened their bills, squeaked, hissed, and puffed in a most outrageous manner; and the noise produced by the multitudes on the island was not merely disagreeable, but really shocking. Some of the nests contained eggs, and the young were of all sizes, from the newly hatched up to those able to fly; none, however, even of the largest, attempted to gain the water, but all preferred hiding themselves in the fissures of the rocks, or behind the nests. It was

curious to see them crawl flat on the rock, assisting themselves with their bill, feet and wings, employing the first in the manner of Parrots, and the wings like the oars of a boat or the flappers of turtles. When approached, they curved and twisted their necks in the most curious manner, reminding one of the writhings of a snake, and when seized they muted so profusely as to excite disgust. A dozen or more of different sizes, however, were thrust into a bag, and carried on board the vessel. The materials and dimensions of the nests were noted on the spot, and a hatful of eggs was brought to me.

The Double-crested Cormorant forms its nest of sea-weeds, some sticks, moss, and clods of earth, with grass adhering to them, which it piles up into a solid mass, often as high as three feet from the rock, with a diameter of fifteen or eighteen inches at the top, and of two and a half feet at the base. The whole has an appearance of solidity seldom seen in the nests of water-birds. The nests are placed as near each other as the nature of the ground will permit, and a great number which appeared to have stood out against the winter storms, had been enlarged and repaired that season. Many, however, lay scattered over the rocks, having been demolished by heavy gales or the breaking of the surf during tempests. The whole surface of the rock resembled a mass of putridity: feathers, broken and rotten eggs, and dead young, lay scattered over it; and I leave you to guess how such a place must smell in a calm warm day. The eggs are three or four, average two and a half inches in length by one inch and four and a half eighths in breadth, and have an elongated form. They are covered with a calcareous coating, which is more or less soiled with filth, but when carefully scraped, shows a fine light greenish-blue tint.

The young, when just hatched, are of a bluish-black colour, tinged with purple, and look extremely odd. They remain blind for several days, and for about a fortnight are fed by the parents with the greatest care, the food being regurgitated into their open throats. They appear to grow rapidly, for in the course of eight or ten days we found some the size of a pullet, which, when marked, were scarcely half that size. They are covered with long down of a brownish-black colour, and do not leave the nest, unless they are intruded on, until they are able to fly, when their parents, who long before had ceased to feed them by dropping the fish into their bill, and had merely placed it on the ground near them, leave them to shift for themselves. By the middle of August all these birds remove southward, along Newfoundland, by Cape Breton Island, and the shores of Nova Scotia, scarcely any remaining on the coast of the first during winter, when indeed not many are seen farther east than the Bay of Halifax.

The fishermen and eggers never gather their eggs, they being unfit for being eaten by any other animals than Gulls or Jagers; but they commit

great havoc among the young, which they salt for food or bait. The old birds are too shy to be killed in great numbers, otherwise their feathers, although they smell strongly of fish, might be turned to account. I have never eaten Cormorant's flesh, and intend to refrain from tasting it until nothing better can be procured.

The flight of this species is strong and well sustained, although not so rapid as that of the Florida Cormorant. It sails at times in a beautiful manner, and at a great height above the waters. Like other species, the Double-crested Cormorants are fond of sunning themselves, with their wings spread out. They walk awkwardly, and cannot run without the aid of their wings. In order to arise from the water, in which they sink so as nearly to be covered when swimming, they are obliged to run and beat the surface for many yards, before they get fairly on wing.* Their food consists of shrimps, lents, capelings, codlings, and other fishes, scarcely any kind coming amiss unless too strong or of too great a size. Of the codlings especially they devour vast numbers, they being in astonishing shoals on the coast of Labrador at the time when the Cormorants are breeding, and indeed remaining until the departure of the birds, when they retire to deeper water. I never saw a Cormorant plunge from the air after its prey, but should be much gratified by such a sight, which, if we trust compilers, is nothing uncommon; nor have I ever seen a bird of this species perched on anything higher than the top of the low island on which the nest is placed, none having been observed by me on any of the high rocks on which the common species breeds in America.

I have given the figure of a beautiful male in its perfect spring plumage. This is probably the only representation of the bird yet presented to the public, and the same remark applies to the Florida Cormorant.

Pelecanus (Carbo) dilophus, *Double-crested Cormorant*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 473.

Double-crested Cormorant, Nutt. Man., vol. ii. p. 483.

Double-crested Cormorant, *Phalacrocorax dilophus*, Aud. Orn. Biog., vol. iii. p. 420; vol. v. p. 629.

Male, 33, 51.

Common as far south as the coast of Maryland, in winter. Breeds in Newfoundland and Labrador, as well as on the Saskatchewan.

Adult Male at the commencement of the breeding season.

Bill about the length of the head, rather slender, somewhat compressed, straight, with the tip curved. Upper mandible with the dorsal line slightly concave, until near the tip, when it is curved, the ridge convex, and separated from the sides by a narrow groove, the sides erect, convex, the edges sharp and straight as far as the unguis, which is strong, convex above,

incurved, acute. No external nostrils. Lower mandible with the angle long and very narrow towards the end, filled by an extensive membrane, which extends a short way down the throat, its dorsal line a little convex, the sides erect and convex, the edges sharp and inflected, the tip compressed and obliquely truncate.

Head rather small, oblong, narrowed before. Neck long and rather slender. Body full, depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all round with scales, of which the anterior and lateral are large and sub-hexagonal, the posterior very small and roundish. Toes all placed in the same plane, and connected by reticulated webs, covered above with very numerous oblique scutella; first toe smallest, fourth longest. Claws rather small, strong, compressed, acute.

Plumage of the head, neck, lower parts and posterior portion of the back glossy, blended and silky, of the fore part of the back and wings compact, the feathers with loose glossy margins. From behind the eye to the length of an inch and a half on each side, an elongated tuft of long slender, loose recurved feathers. Space around the eye, and to a large extent along the base of the bill, together with the small gular sac, bare. Wings rather small; primaries very strong, curved, rather narrow, tapering and obtuse, second longest, third almost equal, first longer than fourth; secondaries decurved, broad, broadly rounded, the inner narrower. Tail of moderate length, very narrow, much rounded or cuneate, of twelve narrow, rounded feathers, having extremely strong shafts.

Upper mandible dusky, along the edges greyish-yellow; lower yellow, irregularly marked with dusky towards the edges. Iris bright green, margin of eyelids, bare space on the head, and gular sac, rich orange. Feet and claws black. All the silky part of the plumage is greenish-black, at a distance appearing black, but at hand in a strong light green. The imbricated feathers of the back and wings greyish-brown, their fringe-like margins greenish-black; primary quills brownish-black; secondary like the other feathers of the wing. Tail black, the shafts of all the feathers black.

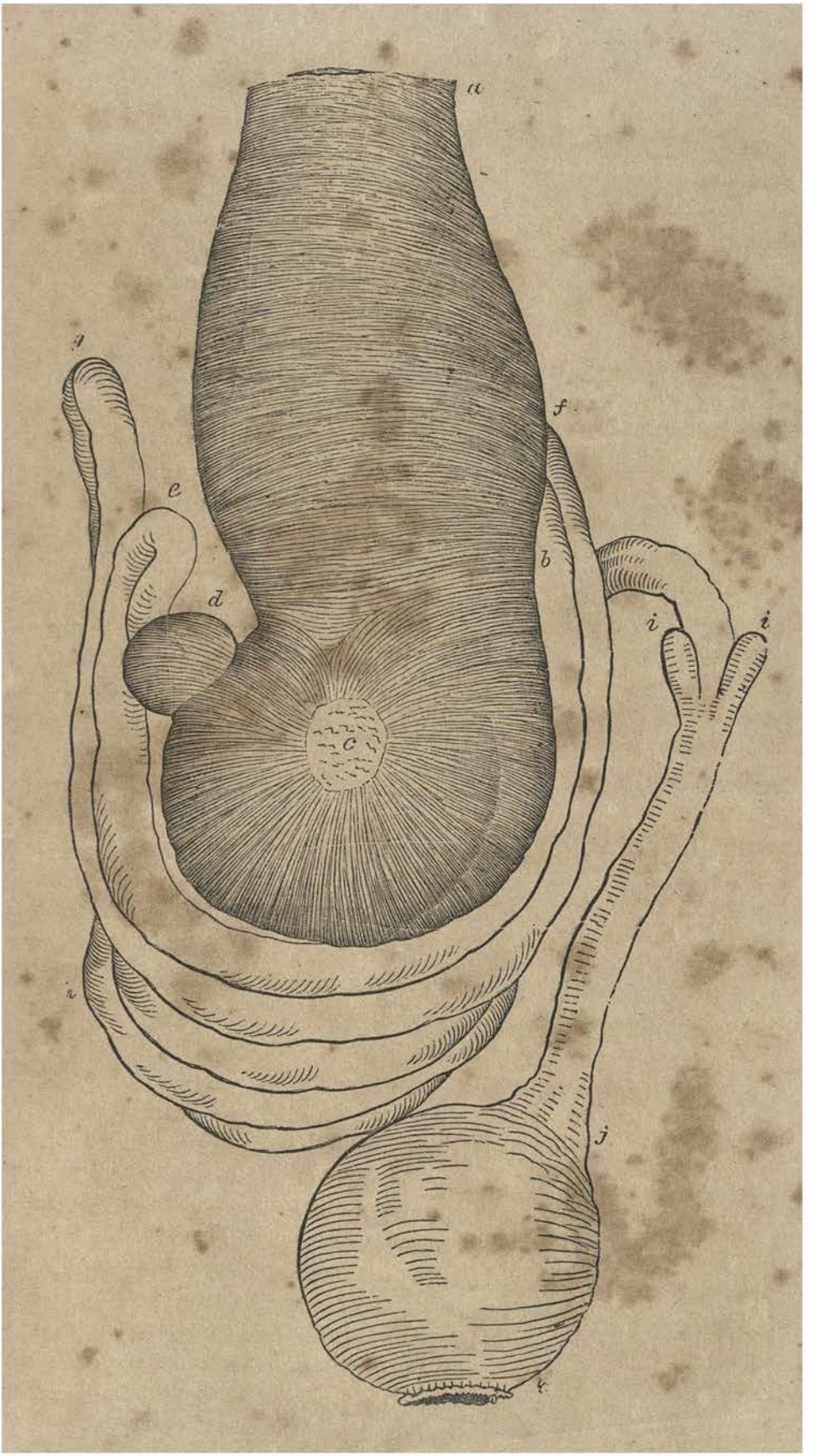
Length to end of tail 33 inches, to end of wings 29, to end of claws 33; extent of wings 51; wing from flexure 13; tail 6¾; bill along the back $2\frac{5}{12}$, along the edge of lower mandible $3\frac{5}{12}$; tarsus $2\frac{7}{12}$; outer toe 3¾, its claw $\frac{11}{12}$. Weight 5 lbs. 7 oz.

The Female is somewhat smaller, but in other respects is similar to the male.

The Young, after the first moult, have the head and neck mottled with greenish-black and greyish-brown; the other parts as in the adult, but the tufts on the head wanting.

The Double-crested and the Florida Cormorants are very nearly allied, their forms, and the structure of their plumage, being precisely similar. There is, however, a very considerable difference in size, as will be seen on comparing their measurements and average weights as given by me. The bills are similar in form, but their colours differ, as do those of the eyelids; but in the breeding season these birds may readily be distinguished by the temporary tufts or crests behind the eyes, which in *P. floridanus* consist of a mere line of single feathers curved downwards, while in *P. dilophus* they are of considerable breadth, and composed of about forty recurved feathers. In the absence of the crests, the difference in size affords the principal means of distinguishing them.

Female. The mouth of this bird, and those of the other Cormorants, differ from those of all the birds hitherto examined and described in these volumes, in having the posterior aperture of the nares placed much farther forward, commencing nearly opposite the anterior angle of the eye, and in this species only 10 twelfths long, with a very prominent ridge on each side, running backwards over the hind part of the palate, which is flattened. The width of the mouth is 1 inch 4 twelfths; but the lower jaw can be dilated to 2 inches, there being a joint on each side at the base, as in Herons. The tongue is a very diminutive ovato-lanceolate, thin, strongly carinate body, ½ inch in length, 3 twelfths in its greatest breadth, with two basal knobs placed close together. Œsophagus 16 inches long, at its commencement 2¼ inches in width, afterwards 2 inches; contracting to 1½ inches as it enters the thorax, and again dilated into a sac 2¼ inches in width, *a b*, which is directly continuous with the stomach, that organ seeming to form its fundus. Its muscular fibres are very distinct, the external being transverse, the internal longitudinal; the inner coat is thrown into prominent longitudinal plicæ. The stomach, *b c d*, is of a roundish form, 2 inches 2 twelfths in diameter; its muscular coat extremely thin, being reduced to a single series of slender muscular fibres; the inner coat quite smooth and soft, as is that of the pyloric lobe, *d*, which is ½ inch in diameter. The proventricular glands, which are very numerous, form a belt, of which the greatest breadth is 1 inch 9 twelfths, but at one place only 1½ inches. The lobes of the liver are extremely unequal, the right being 4 inches, the left only 2; the gall-bladder 1 inch 9 twelfths in length, oblong, 4 twelfths in breadth. The duodenum, *d e f g*, which is 3½ twelfths in breadth, curves upwards at first to the length of 9 twelfths, *d e*, then bends round the stomach, ascends on the left side to the upper part of the proventriculus for the length of 6½ inches, retraces the same course until it reaches the liver, then passes down the right side, and is convoluted, forming twelve turns in all. It measures 5 feet 10 inches in length; its width in the duodenal part is 4¼ twelfths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afterwards 3 twelfths; the cœca *i i*, 6 twelfths long, 3 twelfths broad, 4 inches from the extremity; the rectum, *i j k*, for 3 inches has a width of 4½ twelfths, and terminates in a globular cloaca, *k*, 1 inch 10 twelfths in width.

The trachea is 11 inches long, from 5½ twelfths to 4½ twelfths in breadth, considerably flattened; its rings moderately firm, broad, 138, with 2 additional half rings. Bronchi of moderate width, one with 20, the other with 22 half rings. Lateral muscles large, as are the sterno-tracheal slips.

This species has a slender trigonal bone 10½ twelfths in length, articulated to the crest of the occipital bone. The anterior part of the cerebrum tapers to a point much in the same manner as in the Turkey Buzzard, forming a similar lobe, 4 twelfths in height at its base, from the extremity of which comes off the olfactory nerve, which is about the fifth part of a twelfth in breadth, runs a course of half an inch along the septum of the eyes, and is distributed to the membrane of the nasal cavity, which is of a triangular form, 6 twelfths in length, 5 twelfths in breadth, with a single large turbinated bone. The external aperture of the nostrils is completely obliterated, its place being filled by bony matter. The large branch of the 5th pair of nerves passes in its usual direction to the anterior part of the upper mandible.

THE FLORIDA CORMORANT.

PHALACROCORAX FLORIDANUS, *Aud.*

PLATE CCCCXVII.—MALE.

The Florida Cormorant seldom goes far out to sea, but prefers the neighbourhood of the shores, being found in the bays, inlets, and large rivers. I never met with one at a greater distance from land than five miles. It is at all seasons gregarious, although it is not always found in large flocks. The birds of this species never suffer others of the same genus to resort to their breeding places, although they sometimes associate with individuals belonging to different genera. The *P. Carbo* appropriates to itself the upper shelves of the most rugged and elevated rocks, whose bases are washed by the sea; *P. dilophus* breeds on flat rocky islands at some distance from the shores of the mainland; and the Florida Cormorant nestles

Florida Cormorant

Male.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen. Phila.d

on trees. In the many breeding places of all these species which I have visited, I never found individuals of one intermingled with those of another, although the Large Cormorant did not seem averse from having the Peregrine Falcon in its vicinity, while the Double-crested allowed a few Gannets or Gillemots to nestle beside it, and the Florida Cormorant associated with Herons, Frigate Pelicans, Grakles, or Pigeons.

This species seldom flies far over land, but follows the sinuosities of the shores or the waters of rivers, although its course towards a given point should thus be three times as long. It is the only one that, in as far as I have observed in America, alights on trees. My learned friend, the Prince of MUSIGNANO, mentions in his valuable Synopsis of the Birds of the United States, a species of Cormorant under the name of *P. Graculus*, which he describes as being when adult greenish-black, with a few scattered white streaks on the neck, in winter bronzed, and having a golden-green crest, the head, neck, and thighs with short small white feathers, and adds that it "inhabits both continents and both hemispheres: not uncommon in spring and autumn in the Middle States: very common in the Floridas, where it breeds, though very abundant in the arctic and antarctic circles." Unfortunately no dimensions are given, except of the bill, which is said to be three and a half inches long. The Florida Cormorant, however, does not at any season present these characters, and therefore conceiving it to be different from any hitherto described, I have taken the liberty of giving it a name, while the figure and description will enable the scientific to form a distinct idea of it, and thus to confirm the species, or restore to it its previous appellation, should it have received one.

On the 26th of April, 1832, I and my party visited several small Keys, not many miles distant from the harbour in which our vessel lay. Mr. THRUSTON had given us his beautiful barge, and accompanied us with his famous pilot, fisherman and hunter, Mr. EGAN. The Keys were separated by narrow and tortuous channels, from the surface of the clear waters of which were reflected the dark mangroves, on the branches of which large colonies of Cormorants had already built their nests, and were sitting on their eggs. There were many thousands of these birds, and each tree bore a greater or less number of their nests, some five or six, others perhaps as many as ten. The leaves, branches, and stems of the trees, were in a manner white-washed with their dung. The temperature in the shade was about 90° Fahr., and the effluvia which impregnated the air of the channels was extremely disagreeable. Still the mangroves were in full bloom, and the Cormorants in perfect vigour. Our boat being secured, the people scrambled through the bushes in search of the eggs. Many of the birds dropped into the water, dived, and came up at a safe distance; others in large groups flew

away affrighted; while a great number stood on their nests and the branches, as if gazing upon beings strange to them. But alas! they soon became too well acquainted with us, for the discharges from our guns committed frightful havoc among them. The dead were seen floating on the water, the crippled making towards the open sea, which here extended to the very Keys on which we were, while groups of a hundred or more swam about a little beyond reach of our shot, awaiting the event, and the air was filled with those whose anxiety to return to their eggs kept them hovering over us in silence. In a short time the bottom of our boat was covered with the slain, several hats and caps were filled with eggs; and we may now intermit the work of destruction. You must try to excuse these murders, which in truth might not have been nearly so numerous, had I not thought of you quite as often while on the Florida Keys, with a burning sun over my head, and my body oozing at every pore, as I do now while peaceably scratching my paper with an iron-pen, in one of the comfortable and quite cool houses of the most beautiful of all the cities of old Scotland.

The Florida Cormorant begins to pair about the first of April, and commences the construction of its nest about a fortnight after. Many do not lay quite so early, and I found some going through their preparations until the middle of May. Their courtships are performed on the water. On the morning, beautiful but extremely hot, of the 8th of that month, while rambling over one of the Keys, I arrived at the entrance of a narrow and rather deep channel, almost covered over by the boughs of the mangroves and some tall canes, the only tall canes I had hitherto observed among those islands. I paused, looked at the water, and observing it to be full of fish, felt confident that no shark was at hand. Cocking both locks of my gun, I quietly waded in. Curious sounds now reached my ears, and as the fishes did not appear to mind me much, I proceeded onward among them for perhaps a hundred yards, when I observed that they had all disappeared. The sounds were loud and constantly renewed, as if they came from a joyous multitude. The inlet suddenly became quite narrow, and the water reached to my arm-pits. At length I placed myself behind some mangrove trunks, whence I could see a great number of Cormorants not more than fifteen or twenty yards from me. None of them, it seemed, had seen or heard me; they were engaged in going through their nuptial ceremonies. The males while swimming gracefully around the females, would raise their wings and tail, draw their head over their back, swell out their neck for an instant, and with a quick forward thrust of the head utter a rough guttural note, not unlike the cry of a pig. The female at this moment would crouch as it were on the water, sinking into it, when her mate would sink over her until nothing more than his head was to be seen, and soon afterwards both sprung

up and swam joyously around each other, croaking all the while. Twenty or more pairs at a time were thus engaged. Indeed, the water was covered with Cormorants, and, had I chosen, I might have shot several of them. I now advanced slowly towards them, when they stared at me as you might stare at a goblin, and began to splash the water with their wings, many diving. On my proceeding they all dispersed, either plunging beneath or flying off, and making rapidly towards the mouth of the inlet. Only a few nests were on the mangroves, and I looked upon the spot as analogous to the tournament grounds of the Pinnated Grouse, although no battles took place in my presence. A few beautiful Herons were sitting peaceably on their nests, the mosquitoes were very abundant, large ugly blue land-crabs crawled among the mangroves, hurrying towards their retreats, and I retired, as I had arrived, in perfect silence. While proceeding I could not help remarking the instinctive knowledge of the fishes, and thought how curious it was that, as soon as they had observed the Cormorants' hole, none had gone farther, as if they were well aware of the danger, but preferred meeting me as I advanced towards the birds.

The nest of the Florida Cormorant is of rather a small size, being only eight or nine inches in diameter. It is formed of sticks crossing each other, and is flat, without any appearance of finishing. All the nests are placed on a western exposure, and are usually completely covered with excrement, as are also frequently the eggs, which are three or four, and differ in size, their average length, however, being two inches and a quarter, their greatest breadth one inch and three and a half eighths. They are rendered rather rough by the coating of calcareous matter which surrounds them; but when this is removed, the real shell is found to be of a uniform fine light bluish-green tint. I was unable to ascertain the period of incubation. The young are at first blind, naked, black, and extremely uncouth. On placing some which were quite small on the water, they instantly dived, rose again, and swam about at random, diving on the least noise. If you approach them when about a month old, they throw themselves from the nest and plunge into the water. When undisturbed, they remain in the nest until they are fully fledged and able to fly, after which they undergo various changes, and are not perfect until nearly two years old.

Soon after they are left to shift for themselves, great numbers go to search for food in the quiet waters of inland streams. Thousands may now be seen on the lakes of the interior of the Floridas, and on the large rivers there. At this season many proceed as far as the Capes of North Carolina, the Mississippi, the Arkansas, the Yazoo, and other streams, including the fair Ohio, on which they are at times seen early in October, when they begin to return to the places of their nativity. During several weeks which I spent

on the St. John's river, while on board the United States' schooner-of-war Spark, I was surprised to see the number of these Cormorants already returning towards the keys, so much so that had I been the discoverer of that stream under similar circumstances, I should in all probability have named it Cormorant river. While we were at anchor near its mouth, they passed close to us in long single files almost continually, and, on reaching the sea, bore away towards the south along the shores.

On the Mississippi, in the month of October, when the temperature is considerably lower than in the Floridas, you see these birds during the day standing in their usual inclined position, on the sawyers and planters, as if resting there—so at least was the case in the autumn of 1820,—or on the dead branches of trees along the shores. In cloudy days they sailed high in the air, and in wide circles, after which, as if aware of cold weather being at hand, they swiftly followed in long lines the meandering course of the stream, at a considerable elevation. While sailing aloft, they frequently uttered a note not unlike that of the Raven in similar circumstances. When approached while standing on a planter, instead of taking to wing at once, although elevated several feet above the water, they prefer plunging first into the stream, when they almost instantly rise to the surface, paddle with their feet, and beat with their wings for twenty or thirty yards, and then rise into the air. Now and then, when of a sudden the weather becomes cold at night, you see them at early dawn join in numbers of fifty or perhaps a hundred, rise high in the air, arrange themselves in angular double files, and fly swiftly southward.

When in fresh water streams they fish principally in the eddies, and as soon as one of them is depopulated, or proves unworthy of their farther search, they rise and fly about a foot above the surface to another place, where they continue to fish. In the inner lakes of the Floridas they fish at random anywhere, and this is equally the case around the Keys, and on the bays and inlets along the coast. In fine calm weather, when the sun is pouring down a flood of light and heat, the Cormorants in flocks betake themselves to some clean sand-bar or rocky isle, or alight on trees, where they spread out their wings, and bask at times for hours, in the manner of Vultures and Pelicans.

The Florida Cormorant, like all the other species with which I am acquainted, swims deep, and dives with great expertness, so that it is almost useless to follow one when wounded, unless it has been greatly injured. On seeing an enemy approach, it first beats the water with its wings, as if in play, or as it would do if washing itself, raises both wings for a minute or more, then paddles off, and takes to wing. When on a lake, they prefer diving to flying, swim with all but the neck and head under water, in the

manner of the Anhinga or Snake-bird, and easily dive without shewing their backs.

They procure their food entirely by diving from the surface of the water, never from on wing, as some compilers assert; nay, the very form of their bill, and the want of air-cells, such as plunging birds are usually provided with, prevent them from darting from above into the water, as is the habit of Gannets and other birds which seek for food on wing, go far out to sea, and stand gales such as the Cormorant, which rarely ventures out of sight of the shores, does not dare to encounter, or of those which, like Gulls, pass swiftly in curved lines over the surface, picking up their prey. On emerging, these Cormorants usually swallow their prey if it has been so seized as to enable them to do so with ease; if not, they throw it up to a short distance in the air, receive it with open bill, and gulp it head foremost. If the fish is large, they swim or fly to the shore, or alight on a tree with it, and there beat and tear it to pieces, after which they swallow it. Their appetite is scarcely satiable, and they gorge themselves to the utmost at every convenient opportunity.

The flight of this species is perhaps more rapid than that of the others, and is performed by continued flappings when the bird is travelling, but by alternate flappings and sailings of great elegance during the beginning of the breeding season, or when they collect in large flocks in lowering weather, sometimes also when about to alight. Their food consists chiefly of fish, and they generally prefer those of small size. While on the Florida Keys, I procured five specimens of the Hippocampus, fresh and uninjured, from the gullets of some of these Cormorants. They are hard to kill, and live to a great age.

They are easily treated in captivity; but their awkward movements on the ground, where they often use the tail as a support, render them less pleasing objects than other feathered pets. Besides, they eat and mute inordinately, and instead of charming you with songs, utter no sound excepting a grunt. Their flesh is dark, generally tough, and has a rank fishy taste. The Indians and Negroes of the Floridas kill the young when nearly able to fly, and after skinning them, salt them for food. I have seen them offered for sale in the New Orleans market, the poorer people there making gumbo soup of them.

A bird of this species, which I shot near its breeding place, and which, on being examined, proved to be a female, had the feathers of the tail covered with delicate slender sea-weeds of a bright green colour, such as I have often observed on marine turtles, and which appeared to have actually grown there.

The slender feathers on the sides of the head fall off by the time incubation has commenced, and do not appear during winter, as is alleged by authors

when speaking of the crests or appendages of Cormorants, nor do they last more than a few weeks, as is also the case in the Egrets and Herons.

PHALACROCORAX FLORIDANUS, *Florida Cormorant*, Aud. Orn. Biog., vol. iii. p. 387; vol. v. p. 632.

Male, 29½, 46½.

Constantly resident in the Floridas and their Keys, and along the coast to Texas. The young in summer pass up the Mississippi and Ohio, returning in autumn to the sea. Abundant. Breeds on trees only.

Adult Male in spring.

Bill about the length of the head, rather slender, somewhat compressed, straight, with the tip curved. Upper mandible with the dorsal line slightly concave, until near the tip, when it is decurved, the ridge convex, and separated from the sides by a narrow groove, the sides erect, convex, the edges sharp and straight as far as the unguis, which is strong, convex above, incurved, acute. No external nostrils when full grown. Lower mandible with the angle long and very narrow towards the end, filled by an extensible membrane, which extends a short way down the throat, its dorsal line a little convex, the sides erect and convex, the edges sharp and inflected, the tip compressed and obliquely truncate.

Head rather small, oblong, narrowed before. Neck long and slender. Body rather full, depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all round with scales, of which the anterior and lateral are large and sub-hexagonal, the posterior very small and roundish. Toes all placed in the same plane, and connected by reticulated webs, covered above with very numerous oblique scutella; first toe smallest, fourth longest. Claws rather small, strong, compressed, acute, rounded above, arched, that of the third toe pectinated on its inner edge.

Plumage of the head, neck, lower parts, and posterior portion of the back glossy, blended, and silky, of the fore part of the back and wings compact, the feathers with narrow loose glossy margins. From behind the eye to the length of an inch and a half on each side, a line of extremely slender loose elongated feathers. Space around the eye, and to a large extent along the base of the bill, together with the small gular sac, bare. Wings rather small; primaries very strong, curved, rather narrow, tapering and obtuse, second longest, third almost equal, first longer than fourth; secondaries decurved, broad, broadly rounded, the inner narrower. Tail of moderate length, very narrow, much rounded, or cuneate, of twelve narrow rounded feathers, having extremely strong shafts.

Upper mandible black, along the basal margins bright blue; lower bright blue, curiously spotted with white. Iris light green, margins of eyelids light blue, spotted with white. Bare space on the head and gular sac rich orange. Feet and claws greyish-black. All the silky part of the plumage is greenish-black, at a distance appearing black, but at hand in a strong light green. The imbricated feathers of the back and wings greyish-brown, tinged with purple, their fringe-like margins greenish-black. Primary quills brownish-black, secondary like the other feathers of the wing. Tail brownish-black. The shafts of all the feathers brownish-black.

Length to end of tail 29¼ inches, to end of wings 25½, to end of claws 28½; extent of wings 46½; wing from flexure 11¾; tail 6; bill along the back $2\frac{5}{12}$, along the edge of lower mandible $3\frac{7}{12}$; tarsus 2; outer toe $3\frac{5}{12}$, its claw $\frac{4}{12}$. Weight 3¼ lbs.

The Female is precisely similar to the male.

The young, after their first moult, have the bill dull yellow, the ridge of the upper mandible dusky, the unguis or hook horn-colour; the naked parts about the base of the bill rich yellow, the iris light green, the feet as in the adult. The feathers of the head and neck are blended, but not silky; the upper part of the head and the hind neck are brownish-black, tinged with green, the throat greyish-white, the fore neck and anterior part of the breast variegated with pale brownish-grey and black. The rest of the plumage is as in the adult, but the imbricated feathers of the upper parts of a lighter colour, but not bronzed.

TOWNSEND'S CORMORANT.

PHALACROCORAX TOWNSENDI, *Aud.*

PLATE CCCCXVIII.—MALE.

Two specimens of the Cormorant here represented were sent to me by Mr. TOWNSEND, who procured them at Cape Disappointment in the beginning of October, 1836. They are both marked as males, and agree nearly in colour, but differ somewhat in the length of the bill, and in the extent of the bare space at its base. One of them seems to be in its first plumage, the other in that of the adult. Nothing, I believe, is known of the distribution or habits of this species, which I have honoured with the name of its discoverer.

PHALACROCORAX TOWNSENDI, *Townsend's Cormorant*, Aud. Orn. Biog., vol. v. p. 149.

Male, 35; wing, 12½; tail 6¾.

Cape Disappointment, Columbia river. Common.

Male.

Bill about the length of the head, rather slender, nearly straight, compressed toward the end. Upper mandible with the dorsal line considerably concave, until on the unguis, where it is decurved, the ridge convex, flattened toward the end, separated from the sides by a narrow groove, the sides convex, the edges sharp and nearly straight as far as the unguis, which is decurved, convex above, acute, its tip extending nearly a quarter of an inch beyond the level of the dorsal outline of the lower mandible. No external nostrils. Lower mandible with the angle long and very narrow towards the end, filled up by an extensible membrane, which extends to the level of the angle of the mouth, the outline of the crura very slightly convex, that of the terminal part descending and slightly convex, the sides convex, the edges sharp and inflected, the tip compressed, with its marginal outline decurved.

Head rather small, oblong. Neck long, and rather thick. Body full, elongated, and depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all round with angular scales, of which the anterior are larger, a series on part of the inner side anteriorly, and another on the lower part of the outer,

Townsend's Cormorant

Male

Drawn from Nature by J. J. Audubon, F.R.S.F.L.S.

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scutelliform. Toes all placed in the same plane, connected by reticulated webs, and covered above with numerous broad but very short oblique scutella; first toe smallest, fourth longest. Claws rather small, strong, compressed, acute, convex above, arched, that of the third toe pectinated on its inner edge.

Plumage soft, generally blended, compact on the back and wings, glossy on the head, hind neck, and rump; the feathers on the head and neck oblong, on the back ovato-elliptical. The small gular sac, and the space before and beneath the eye, with the eyelids, bare. Wings of moderate size, broad; primaries curved, pointed, the first, second, and third with the inner web cut out toward the end, the first three and a half twelfths shorter than the second, which is longest, but exceeds the third only by one twelfth; secondaries long and rounded. Tail of moderate length, very narrow, much rounded, or cuneate, of twelve narrow strong-shafted feathers.

Bill yellow, with the ridge brown; gular sac and bare skin about the eyes orange. The upper part of the head and hind neck are dusky, tinged with green, the hind part of the back greenish-black; the rest of the upper parts brownish-grey, each feather margined with black. The quills are also brownish-grey, edged with black, the outer primaries and the tail-feathers black. The sides of the head, the fore part of the neck, and the breast light yellowish-brown, the middle of the neck in front darker, the sides, abdomen, and tibial feathers, shaded into brownish-black, tinged with green. On the sides of the neck and on the hind part of the sides of the body are a few scattered white piliform feathers with a terminal pencil of filaments.

Length to end of tail 35 inches; bill along the ridge $2\frac{1}{2}$; along the edge of lower mandible $3\frac{4}{12}$; wing from flexure $12\frac{1}{2}$; tail $6\frac{9}{12}$; tarsus $2\frac{1}{2}$; first toe 1, its claw $\frac{7}{12}$; second toe $1\frac{11}{12}$, its claw $\frac{6}{12}$; hind toe $2\frac{8}{12}$, its claw $\frac{6}{12}$; fourth toe $3\frac{1}{2}$, its claw $\frac{6}{12}$.

Another individual, apparently a bird in its first plumage, has the head and upper part of the fore neck darker, the middle of the breast lighter, the feathers on the back margined with greyish-brown and an inner band of dark brown. Its bill is longer, but more slender, the unguis less curved, the feathers not entirely obliterated from the space before the eye, and extending farther on the gular sac. It is obviously however of the same species.

VIOLET-GREEN CORMORANT.

PHALACROCORAX RESPLENDENS, *Aud.*

PLATE CCCCXIX.—ADULT.

This Cormorant, the most beautiful hitherto found within the limits of the United States, was obtained by Mr. TOWNSEND at Cape Disappointment, near the entrance of the Columbia river. The specimen from which the figure in the plate was taken, was transmitted to me by that zealous student of Nature. The beautiful gloss of its silky plumage suggested the specific name which I have given to it.

VIOLET-GREEN CORMORANT, *Phalacrocorax resplendens*, Aud. Orn. Biog., vol. v. p. 148.

Female, 27; wing 10; tail 5½.

Cape Disappointment, near Columbia river. Abundant.

Adult.

Bill about the length of the head, slender, cylindrical, enlarged at the base, and compressed toward the end, straight. Upper mandible with the dorsal line very slightly concave, until on the unguis, where it is decurved, the ridge convex, flattened toward the end, separated from the sides by a narrow groove, the sides convex, the edges sharp and straight as far as the unguis, which is decurved, convex above, acute, its tip not extending beyond the level of the dorsal outline of the lower mandible. No external nostrils. Lower mandible with the angle long and very narrow towards the end, filled up by an extensile membrane which does not extend beyond the level of the eye, its very short dorsal line considerably convex, the sides erect and very convex, the edges sharp and inflected, the tip compressed and truncate.

Head small, oblong. Neck long and slender. Body rather full, elongated, and depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all round with scales, of which a series on the inner side anteriorly, and another on the outer, are scutelliform, the posterior very small and roundish. Toes all placed in the same plane, connected by reticulated webs, and covered above with numerous broad but very short oblique scutella; first toe smallest,

Violet-green Cormorant.

Female in Winter.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S. Lith.d Printed & Col.d by J.T. Bowen, Phila.a

fourth longest. Claws rather small, strong, compressed, acute, convex above, arched, that of the third toe pectinated on its inner edge.

Plumage silky, being very soft, blended, and highly glossed. Feathers of the head and neck oblong, of the other parts ovate and rounded. The small gular sac, and the space before and beneath the eye, with the eyelids, bare. Wings rather small, broad; primaries curved; in the only individual in my possession, in which they are not fully developed, the first is an inch and four and a half twelfths shorter than the second, which is longest, but exceeds the third only by a twelfth; secondaries broadly rounded. Tail of moderate length, very narrow, much rounded or cuneate, lateral feathers being an inch and ten-twelfths shorter than the middle; the feathers, twelve in number, are narrow, with very strong shafts.

Bill dusky, gular sac and bare skin about the eyes orange. Iris light green. Feet black. The general colour of the plumage is deep green, seeming black in some lights, and bright green and purple in others. Along the sides of the neck and the hind part of the sides of the body, are scattered numerous white piliform feathers, terminated by a pencil of filaments. The quills and tail-feathers are brownish-black, and less glossy.

Length to end of tail 27 inches; bill along the ridge $1\frac{1}{12}$, along the edge of lower mandible $2\frac{8}{12}$; wing from flexure 10; tail $5\frac{1}{2}$; tarsus $1\frac{9}{12}$; hind toe $\frac{10}{12}$, its claw $\frac{5}{12}$; second toe $1\frac{7}{12}$, its claw $\frac{11}{12}$; third toe $2\frac{1}{4}$, its claw $\frac{9}{12}$; fourth toe $3\frac{2}{12}$, its claw $\frac{7}{12}$.

Genus II.—PLOTUS, *Linn.* ANHINGA.

Bill about twice the length of the head, almost straight, being very slightly recurved, rather slender, compressed, tapering to a fine point; upper mandible with the dorsal line slightly declinate, very slightly convex, the ridge convex, gradually narrowed, the sides sloping, the edges sharp, and beyond the middle cut into minute slender-pointed serratures directed backwards, the tip acuminate; lower mandible with the angle very long and narrow, the dorsal line beyond it straight and ascending, the sides sloping slightly outwards, the edges sharp and serrated, the point extremely narrow; gap-line ascending towards the end. No external nostrils in the adult. Head very small, oblong; neck very long and slender; body elongated and slender. Feet very short and stout; tibia feathered to the point; tarsus very short, roundish, reticulated; toes all connected by webs, the first of moderate length, the fourth longest, the first toe and the first phalanges of the rest with transverse series of scales, the rest of their extent scutellate. Claws rather large, very strong, compressed, curved, very acute, the third with parallel slits on the inner edge. A bare space at the base of the upper mandible, including the eye; skin of the throat bare and dilated, as in the Cormorants. Plumage close, blended, silky, the feathers oblong; scapulars elongated, lanceolate, compact, the outer web of the largest undulated. Wings of moderate length and breadth; third quill longest, inner secondaries elongated and resembling the posterior scapulars. Tail very long, narrow, of twelve straight feathers, having very strong shafts, and increasing in breadth to the end. Tongue a slight oblong knob; œsophagus very wide; proventricular glands placed on the right side in the form of a globular sac; stomach roundish, of moderate size, rather thin, with its inner coat soft and smooth; a large roundish pyloric lobe; intestine long and very slender; no cœca, but a small rounded termination to the rectum.

American Anhinga Snake Bird.

1. Male. 2. Female.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. Lith.d Printed & Col.d by J. T. Bowen, Philad.a

AMERICAN ANHINGA OR SNAKE-BIRD.

PLOTUS ANHINGA, *Linn.*

PLATE CCCCXX.—MALE AND FEMALE.

The Snake-bird is a constant resident in the Floridas, and the lower parts of Louisiana, Alabama, and Georgia. Few remain during winter in South Carolina, or in any district to the eastward of that State; but some proceed as far as North Carolina in spring, and breed along the coast. I have found it in Texas in the month of May, on the waters of Buffalo Bayou, and the St. Jacinto river, where it breeds, and where, as I was told, it spends the winter. It rarely ascends the Mississippi beyond the neighbourhood of Natchez, from which most of the individuals return to the mouths of that great stream, and the numerous lakes, ponds, and bayous in its vicinity, where I have observed the species at all seasons, as well as in the Floridas.

Being a bird which, by its habits, rarely fails to attract the notice of the most indifferent observer, it has received various names. The Creoles of Louisiana, about New Orleans, and as far up the Mississippi as Pointe Coupé, call it "Bec à Lancette," on account of the form of its bill; whilst at the mouths of the river it bears the name of "Water Crow." In the southern parts of Florida, it is called the "Grecian Lady," and in South Carolina it is best known by the name of "Cormorant." Yet in all these parts, it bears also the name of "Snake-bird;" but it is nowhere with us called the "Black-bellied Darter," which, by the way, could only be with strict propriety applied to the adult male.

Those which, on the one hand, ascend the Mississippi, and, on the other, visit the Carolinas, arrive at their several places of resort early in April, in some seasons even in March, and there remain until the beginning of November. Although this bird is occasionally seen in the immediate vicinity of the sea, and at times breeds not far from it, I never met with an individual fishing in salt water. It gives a decided preference to rivers, lakes, bayous, or lagoons in the interior, always however in the lowest and most level parts of the country. The more retired and secluded the spot, the more willingly does the Snake-bird remain about it. Sometimes indeed I have suddenly come on some in such small ponds, which I discovered by mere accident, and in parts of woods so very secluded, that I was taken by

surprise on seeing them. The Floridas therefore are peculiarly adapted for this species, as there the torpid waters of the streams, bayous, and lakes, are most abundantly supplied with various species of fish, reptiles, and insects, while the temperature is at all seasons congenial, and their exemption from annoyance almost unparalleled. Wherever similar situations occur in other parts of the Southern States, there the Anhingas are met with in numbers proportioned to the extent of the favourable localities. It is very seldom indeed that any are seen on rapid streams, and more especially on clear water, a single instance of such an occurrence being all that I have observed. Wherever you may chance to find this bird, you will perceive that it has not left itself without the means of escape; you will never find one in a pond or bayou completely enclosed by tall trees, so as to obstruct its passage; but will observe that it generally prefers ponds or lakes surrounded by deep and almost impenetrable morasses, and having a few large trees growing out of the water near their centre, from the branches of which they can easily mark the approach of an enemy, and make their escape in good time. Unlike the Fish-hawk and King-fisher, the Anhinga however never plunges or dives from an eminence in procuring its prey, although from its habit of occasionally dropping in silence to the water from its perch, for the purpose of afterwards swimming about and diving in the manner of the Cormorant, some writers have been led to believe that it does so.

The Black-bellied Darter, all whose names I shall use, for the purpose of avoiding irksome repetitions, may be considered as indefinitely gregarious; by which I mean that you may see eight or more together at times, during winter especially, or only two, as in the breeding season. On a few occasions, whilst in the interior of the southernmost parts of Florida, I saw about thirty individuals on the same lake. While exploring the St. John's river of that country in its whole length, I sometimes saw several hundreds together. I procured a great number on that stream, on the lakes in its neighbourhood, and also on those near the plantation of Mr. BULOW, on the eastern side of the Peninsula. I observed that the young Darters, as well as those of the Cormorants, Herons, and many other birds, kept apart from the old individuals, which they however joined in spring, when they had attained their full beauty of plumage.

The Anhinga is altogether a diurnal bird, and, like the Cormorant, is fond of returning to the same roosting place every evening about dusk, unless prevented by molestation. At times I have seen from three to seven alight on the dead top branches of a tall tree, for the purpose of there spending the night; and this they repeated for several weeks, until on my having killed some of them and wounded others, the rest abandoned the spot, and after several furious contests with a party that roosted about two miles off,

succeeded in establishing themselves among them. At such times they seldom sit very near each other, as Cormorants do, but keep at a distance of a few feet or yards, according to the nature of the branches. Whilst asleep, they stand with the body almost erect, but never bend the tarsus so as to apply it in its whole length, as the Cormorant does; they keep their head snugly covered among their scapulars, and at times emit a wheezing sound, which I supposed to be produced by their breathing. In rainy weather they often remain roosted the greater part of the day, and on such occasions they stand erect, with their neck and head stretched upwards, remaining perfectly motionless, as if to allow the water to glide off their plumage. Now and then, however, they suddenly ruffle their feathers, violently shake themselves, and again compressing their form, resume their singular position.

Their disposition to return to the same roosting places is so decided that, when chased from their places of resort, they seldom fail to betake themselves to them during the day; and in this manner they may easily be procured with some care. Whilst at Mr. BULOW's, I was almost daily in the habit of visiting a long, tortuous bayou, many miles in extent, which at that season (winter) was abundantly supplied with Anhingas. There the Otter, the Alligator, and many species of birds, found an ample supply of food; and as I was constantly watching them, I soon discovered a roosting place of the Snake-birds, which was a large dead tree. I found it impossible to get near them either by cautiously advancing in the boat, or by creeping among the briars, canes, and tangled palmettoes which profusely covered the banks. I therefore paddled directly to the place, accompanied by my faithful and sagacious Newfoundland dog. At my approach the birds flew off towards the upper parts of the stream, and as I knew that they might remain for hours, I had a boat sent after them with orders to the Negroes to start all that they could see. Dragging up my little bark, I then hid myself among the tangled plants, and, with my eyes bent on the dead tree, and my gun in readiness, I remained until I saw the beautiful bird alight and gaze around to see if all was right. Alas! it was not aware of its danger, but, after a few moments, during which I noted its curious motions, it fell dead into the water, while the reverberations consequent on the discharge of my gun alarmed the birds around, and by looking either up or down the bayou I could see many Anhingas speeding away to other parts. My dog, as obedient as the most submissive of servants, never stirred until ordered, when he would walk cautiously into the water, swim up to the dead bird, and having brought it to me, lie down gently in his place. In this manner, in the course of one day I procured fourteen of these birds, and wounded several others. I may here at once tell you that all the roosting places of the Anhinga which I have seen were over the water, either on the shore or

in the midst of some stagnant pool; and this situation they seem to select because there they can enjoy the first gladdening rays of the morning sun, or bask in the blaze of its noontide splendour, and also observe with greater ease the approach of their enemies, as they betake themselves to it after feeding, and remain there until hunger urges them to fly off. There, trusting to the extraordinary keenness of their beautiful bright eyes in spying the marauding sons of the forest, or the not less dangerous enthusiast, who, probably like yourself, would venture through mud and slime up to his very neck, to get within rifle shot of a bird so remarkable in form and manners, the Anhingas, or "Grecian Ladies," stand erect, with their wings and tail fully or partially spread out in the sunshine, whilst their long slender necks and heads are thrown as it were in every direction by the most curious and sudden jerks and bendings. Their bills are open, and you see that the intense heat of the atmosphere induces them to suffer their gular pouch to hang loosely. What delightful sights and scenes these have been to me, good reader! With what anxiety have I waded toward these birds, to watch their movements, while at the same time I cooled my over-heated body, and left behind on the shores myriads of hungry sand-flies, gnats, mosquitoes, and ticks, that had annoyed me for hours!

The peculiar form, long wings, and large fan-like tail of the Anhinga, would at once induce a person looking upon it to conclude that it was intended by nature rather for protracted and powerful flight, than for spending as it does more than half of its time by day in the water, where its progress, one might suppose, would be greatly impeded by the amplitude of these parts. Yet how different from such a supposition is the fact? The Anhinga in truth is the very first of all fresh-water divers. With the quickness of thought it disappears beneath the surface, and that so as scarcely to leave a ripple on the spot; and when your anxious eyes seek around for the bird, you are astonished to find it many hundred yards distant, the head perhaps merely above water for a moment; or you may chance to perceive the bill alone gently cutting the water, and producing a line of wake not observable beyond the distance of thirty yards from where you are standing. With habits like these it easily eludes all your efforts to procure it. When shot at while perched, however severely wounded they may be, they fall at once perpendicularly, the bill downward, the wings and tail closed, and then dive and make their way under water to such a distance that they are rarely obtained. Should you, however, see them again, and set out in pursuit, they dive along the shores, attach themselves to roots of trees or plants by the feet, and so remain until life is extinct. When shot dead on the trees, they sometimes cling so firmly to the branches that you must wait some minutes before they fall.

The generally received opinion or belief that the Anhinga always swims with its body sunk beneath the surface is quite incorrect; for it does so only when in sight of an enemy, and when under no apprehension of danger it is as buoyant as any other diving bird, such as a Cormorant, a Merganser, a Grebe, or a Diver. This erroneous opinion has, however, been adopted simply because few persons have watched the bird with sufficient care. When it first observes an enemy, it immediately sinks its body deeper, in the manner of the birds just mentioned, and the nearer the danger approaches, the more does it sink, until at last it swims off with the head and neck only above the surface, when these parts, from their form and peculiar sinuous motion, somewhat resemble the head and part of the body of a snake. It is in fact from this circumstance that the Anhinga has received the name of Snake-bird. At such a time, it is seen constantly turning its head from side to side, often opening its bill as if for the purpose of inhaling a larger quantity of air, to enable it the better to dive, and remains under water so long that when it next makes its appearance it is out of your reach. When fishing in a state of security it dives precisely like a Cormorant, returns to the surface as soon as it has procured a fish or other article of food, shakes it, if it is not too large often throws it up into the air, and receiving it conveniently in the bill, swallows it at once, and recommences its search. But I doubt much if it ever seizes on anything that it cannot thus swallow whole. They have the curious habit of diving under any floating substances, such as parcels of dead weeds or leaves of trees which have accidentally been accumulated by the winds or currents, or even the green slimy substances produced by putrefaction. This habit is continued by the species when in a perfect state of domestication, for I have seen one kept by my friend JOHN BACHMAN thus diving when within a few feet of a quantity of floating rice-chaff, in one of the tide-ponds in the neighbourhood of Charleston. Like the Common Goose, it invariably depresses its head while swimming under a low bridge, or a branch or trunk of a tree hanging over the water. When it swims beneath the surface of the water, it spreads its wings partially, but does not employ them as a means of propulsion, and keeps its tail always considerably expanded, using the feet as paddles either simultaneously or alternately.

The quantity of fish consumed by this bird is astonishing, and what I am about to relate on this subject will appear equally so. One morning Dr. BACHMAN and I gave to an Anhinga a Black Fish, measuring nine and a half inches, by two inches in diameter; and although the head of the fish was considerably larger than its body, and its strong and spinous fins appeared formidable, the bird, which was then about seven months old, swallowed it entire, head foremost. It was in appearance digested in an hour and a half,

when the bird swallowed three others of somewhat smaller size. At another time, we placed before it a number of fishes about seven and a half inches long, of which it swallowed nine in succession. It would devour at a meal forty or more fishes about three inches and a half long. On several occasions it was fed on Plaice, when it swallowed some that were four inches broad, extending its throat, and compressing them during their descent into the stomach. It did not appear to relish eels, as it eat all the other sorts first, and kept them to the last; and after having swallowed them, it had great difficulty in keeping them down, but, although for awhile thwarted, it would renew its efforts, and at length master them. When taken to the tide-pond at the foot of my friend's garden, it would now and then after diving return to the surface of the water with a cray-fish in its mouth, which it pressed hard and dashed about in its bill, evidently for the purpose of maiming it, before it would attempt to swallow it, and it never caught a fish without bringing it up to subject it to the same operation.

While residing near Bayou Sara, in the State of Mississippi, I was in the habit of occasionally visiting some acquaintances residing at Pointe Coupé, nearly opposite the mouth of the bayou. One day, on entering the house of an humble settler close on the western bank of the Mississippi, I observed two young Anhingas that had been taken out of a nest containing four, which had been built on a high cypress in a lake on the eastern side of the river. They were perfectly tame and gentle, and much attached to their foster-parents, the man and woman of the house, whom they followed wherever they went. They fed with equal willingness on shrimps and fish, and when neither could be had, contented themselves with boiled Indian corn, of which they caught with great ease the grains as they were thrown one by one to them. I was afterwards informed, that when a year old, they were allowed to go to the river and fish for themselves, or to the ponds on either side, and that they regularly returned towards night for the purpose of roosting on the top of the house. Both birds were males, and in time they fought hard battles, but at last each met with a female, which it enticed to the roost on the house-top, where all the four slept at night for awhile. Soon after, the females having probably laid their eggs in the woods, they all disappeared, and were never again seen by the persons who related this curious affair.

The Anhinga moves along the branches of trees rather awkwardly; but still it walks there, with the aid of its wings, which it extends for that purpose, and not unfrequently also using its bill in the manner of a Parrot. On the land, it walks and even runs with considerable ease, certainly with more expertness than the Cormorant, though much in the same style. But it does not employ its tail to aid it, for, on the contrary, it carries that organ inclined upwards, and during its progress from one place to another, the

movements of its head and neck are continued. These movements, which, as I have said, resemble sudden jerkings of the parts to their full extent, become extremely graceful during the love season, when they are reduced to gentle curvatures. I must not forget to say, that during all these movements, the gular pouch is distended, and the bird emits rough guttural sounds. If they are courting on wing, however, in the manner of Cormorants, Hawks, and many other birds, they emit a whistling note, somewhat resembling that of some of our rapacious birds, and which may be expressed by the syllables *eek*, *eek*, *eek*, the first loudest, and the rest diminishing in strength. When they are on the water, their call-notes so much resemble the rough grunting cries of the Florida Cormorant, that I have often mistaken them for the latter.

The flight of the Anhinga is swift, and at times well sustained; but like the Cormorants, it has the habit of spreading its wings and tail before it leaves its perch or the surface of the water, thus frequently affording the sportsman a good opportunity of shooting it. When once on wing, they can rise to a vast height, in beautiful gyrations, varied during the love-season by zigzag lines chiefly performed by the male, as he plays around his beloved. At times they quite disappear from the gaze, lost as it were, in the upper regions of the air; and at other times, when much lower, seem to remain suspended in the same spot for several seconds. All this while, and indeed as long as they are flying, their wings are directly extended, their neck stretched to its full length, their tail more or less spread according to the movements to be performed, being closed when they descend, expanded and declined to either side when they mount. During their migratory expeditions, they beat their wings at times in the manner of the Cormorant, and at other times sail like the Turkey Buzzard and some Hawks, the former mode being more frequently observed when they are passing over an extent of woodland, the latter when over a sheet of water. If disturbed or alarmed, they fly with continuous beats of the wings, and proceed with great velocity. As they find difficulty in leaving their perch without previously expanding their wings, they are also, when about to alight, obliged to use them in supporting their body, until their feet have taken a sufficient hold of the branch on which they desire to settle. In this respect, they exactly resemble the Florida Cormorant.

The nest of the Snake-bird is variously placed in different localities; sometimes in low bushes, and even on the common smilax, not more than eight or ten feet above the water, if the place be secluded, or on the lower or top branches of the highest trees, but always over the water. In Louisiana and the State of Mississippi, where I have seen a goodly number of nests, they were generally placed on very large and tall cypresses, growing out of the central parts of lakes and ponds, or overhanging the borders of lagoons, bayous, or rivers, distant from inhabited places. They are fre-

quently placed singly, but at times amidst hundreds or even thousands of nests of several species of Herons, especially *Ardea alba*, and *A. Herodias* the Great White and Great Blue Herons. As however in all cases the form, size, and component materials are nearly the same, I will here describe a nest procured for the purpose by my friend BACHMAN.

It measured fully two feet in diameter, and was of a flattened form, much resembling that of the Florida Cormorant. The first or bottom layer was made of dry sticks of different sizes, some nearly half an inch in diameter, laid crosswise, but in a circular manner. Green branches with leaves on them, of the common myrtle, *Myrica cerifera*, a quantity of Spanish moss, and some slender roots, formed the upper and inside layer, which was as solid and compact as that of any nest of the Heron tribe. This nest contained four eggs; another examined on the same day had four young birds; a third only three; and in no instance has a nest of the Anhinga been found with either eight eggs, or "two eggs and six young ones," as mentioned by Mr. ABBOTT, of Georgia, in his notes transmitted to WILSON. Mr. ABBOTT is however correct in saying that this species "will occupy the same tree for a series of years," and I have myself known a pair to breed in the same nest three seasons, augmenting and repairing in every succeeding spring, as Cormorants and Herons are wont to do. The eggs average two inches and five-eighths in length, by one and a quarter in diameter, and are of an elongated oval form, of a dull uniform whitish colour externally, being covered with a chalky substance, beneath which the shell, on being carefully scraped, is of a light blue, precisely resembling in this respect the eggs of the different species of American Cormorants with which I am acquainted.

The young when about a fortnight old are clad with a uniform buff-coloured down; their bill is black, their feet yellowish-white, their head and neck nearly naked; and now they resemble young Cormorants, though of a different colour. The wing feathers make their appearance through the down, and are dark brown. The birds in the same nest differ as much in size as those of Cormorants, the largest being almost twice the size of the smallest. At this age they are in the habit of raising themselves by placing their bills on the upper part of the nest, or over a branch if convenient, and drawing themselves up by their jaws, which on such occasions they open very widely. This habit is continued by young birds whilst in confinement, and was also observed in the Cormorant, *Phalacrocorax Carbo*, the young of which assisted themselves with their bills while crawling about on the deck of the Ripley. The action is indeed performed by the Anhinga at all periods of its life. At an early age the young utter a low wheezing call, and at times some cries resembling those of the young of the smaller species of Herons. From birth they are fed by regurgitation, which one might suppose an irksome task to the parent birds, as during the act they open

their wings and raise their tails. I have not been able to ascertain the period of incubation, but am sure that the male and the female sit alternately, the latter however remaining much longer on the nest. Young Anhingas when approached while in the nest cling tenaciously to it, until seized, and if thrown down, they merely float on the water, and are easily captured.

When they are three weeks old, the quills and tail-feathers grow rapidly, but continue of the same dark-brown colour, and so remain until they are able to fly, when they leave the nest, although they still present a singular motley appearance, the breast and back being buff-coloured, while the wings and tail are nearly black. After the feathers of the wings and tail are nearly fully developed, those of the sides of the body and breast become visible through the down, and the bird appears more curiously mottled than before. The young male now assumes the colour of the adult female, which it retains until the beginning of October, when the breast becomes streaked with dusky; white spots shew themselves on the back, the black of which becomes more intense, and the crimpings on the two middle feathers of the tail, which have been more or less apparent from the first, are now perfect. By the middle of February, the male is in full plumage, but the eyes have not yet acquired their full colour, being only of a dull reddish-orange. In this respect also two differences are observed between the Anhinga and the Cormorants. The first is the rapid progress of the Anhinga towards maturity of plumage, the other the retaining of its complete dress through the whole of its life, no change taking place in its colours at each successive moult. The Cormorants, on the contrary, take three or four years to attain their full dress of the love season, which lasts only during that period of excitement. The progress of the plumage in the female Anhinga is as rapid as in the male, and the tints also remain unaltered through each successive moult.

Like all other carnivorous and piscivorous birds, the Anhinga can remain days and nights without food, apparently without being much incommoded. When overtaken on being wounded, and especially if brought to the ground, it seems to regard its enemies without fear. On several occasions of this kind, I have seen it watch my approach, or that of my dog, standing as erect as it could under the pain of its wounds, with its head drawn back, its bill open, and its throat swelled with anger until, when at a sure distance, it would dart its head forward and give a severe wound. One which had thus struck at my dog's nose, hung to it until dragged to my feet over a space of thirty paces. When seized by the neck, they scratch severely with their sharp claws, and beat their wings about you with much more vigour than you would suppose they could possess.

The substances which I have found in many individuals of this species were fishes of various kinds, aquatic insects, crays, leeches, shrimps, tadpoles,

eggs of frogs, water-lizards, young alligators, water-snakes, and small terrapins. I never observed any sand or gravel in the stomach. On some occasions I found it distended to the utmost, and, as I have already stated, the bird has great powers of digestion. Its excrements are voided in a liquid state, and squirted to a considerable distance, as in Cormorants, Hawks, and all birds of prey.

The flesh of the Anhinga, after the bird is grown, is dark, firm, oily, and unfit for food, with the exception of the smaller pectoral muscles of the female, which are white and delicate. The crimpings of the two middle tail-feathers become more deeply marked during the breeding season, especially in the male. When young, the female shews them only in a slight degree, and never has them so decided as the male.

PLOTUS ANHINGA, Bonap. Syn., p. 411.
BLACK-BELLIED DARTER, *Plotus melanogaster*, Wils. Amer. Orn., vol. ix. p. 75.
BLACK-BELLIED DARTER, Nutt. Man., vol. ii. p. 507.
ANHINGA or SNAKE-BIRD, *Plotus Anhinga*, Aud. Orn. Biog., vol. iv. p. 136.

Male, 35½, 44. Female, 34, 43.

Constant resident from Florida to Georgia; in summer as far east as North Carolina, and up the Mississippi to Natchez. Common.

Adult Male.

Bill about twice the length of the head, almost straight, being very slightly recurved, rather slender, compressed, tapering to a fine point. Upper mandible with the dorsal outline slightly declinate, and almost straight, being however somewhat convex, the ridge convex, gradually narrowed, the sides sloping, the edges sharp, and beyond the middle cut into *minute* slender-pointed serratures, which are directed backwards; the tips very slender. Lower mandible with the angle very long and narrow, the dorsal line beyond it straight and ascending, the sides sloping slightly outwards, the edges sharp and serrated like those of the upper, the point extremely narrow; the gap line slightly ascending towards the end. No external nostrils.

Head very small, oblong. Neck very long and slender. Body elongated and slender. Feet very short and stout. Tibia feathered to the joint. Tarsus very short, roundish, reticulated all over, the scales on the hind part extremely small. Toes all connected by webs; the first of moderate length, the second much longer, the fourth longest and slightly margined externally; the first toe, and the first phalanges of the rest, covered above with transverse series of scales, the rest of their extent scutellate. Claws rather large, very strong, compressed, curved, very acute; the outer smallest, the third longest, with a deep groove on the inner side, and a narrow thin edge, cut with parallel slits; those of the first and second toes nearly equal.

There is a bare space at the base of the upper mandible, including the eye; the skin of the throat is bare and dilated, like that of the Cormorants. The plumage of the head, neck, and body, is close, blended, and of a silky texture; the feathers oblong, rounded, with the filament disunited toward the end. On each side of the neck, from near the eye to half its length, is a series of elongated narrow loose feathers, a few of which are also dispersed over the back of the neck, and which in the breeding season are an inch and a quarter in length. The scapulars, which are very numerous, are elongated, lanceolate, tapering to a point, compact, stiffish, elastic, highly glossed, gradually increasing in size backwards, the outer web of the largest crimped. Wings of moderate length and breadth; primaries strong, firm, considerably curved, the third longest, the second almost as long, the first a little shorter than the fourth; the second, third, and fourth cut out on the outer web. Secondaries a little decurved, broad, rounded, and acuminate; the inner elongated, straightish, acuminate, and resembling the posterior scapulars. Tail very long, narrow, of twelve straight feathers having strong shafts, and increasing in breadth from the base to the end, which is rounded and very broad, the two middle feathers have their outer webs curiously marked with transverse alternate ridges and depressions.

Upper mandible dusky olive, the edges yellow; lower mandible bright yellow, the edges and tips greenish; bare space about the eye bluish-green; gular sac bright orange. Iris bright carmine. Tarsi and toes anteriorly dusky olive, the hind parts and webs yellow; claws brownish-black. The general colour of the head, neck, and body, is glossy blackish-green; of the scapulars, wings, and tail, glossy bluish-black. The long loose feathers on the neck are purplish-white or pale lilac. The lower part of the neck behind is marked with very numerous minute oblong spots of white; which form two broad bands extending backwards, and gradually becoming more elongated, there being one along the centre of each feather including the scapulars. The smaller wing-coverts are similarly marked with broader white spots disposed in regular rows; the four last of which have merely a central line towards the tip, while the inner has a broad band extending from near the base over the outer half of the inner web, and towards the end including a portion of the outer web; the first row of small coverts and the secondary coverts are white, excepting the portion of the inner web. The five inner elongated secondaries are marked with a narrow white band, occupying the inner half of the outer web, from about an inch from their base to the extremity, near which it includes a part of the inner web. The tail-feathers tipped with a band of brownish-red, fading into white.

Length to end of tail 35⅝ inches, to end of wings 30¼, to end of claws 28½, to carpus 17½; extent of wings 44; wing from flexure 14; tail 11½; bill along the ridge 3¼, along the edge of lower mandible 3 1/16; tarsus 1 7/16; hind

toe $\frac{11}{12}$, its claw $\frac{6}{12}$; second toe $1\frac{9}{12}$, its claw $\frac{11}{12}$; third toe $2\frac{5}{12}$, its claw $\frac{8}{12}$; fourth toe $2\frac{11}{12}$, its claw $\frac{11}{12}$. Weight $3\frac{1}{4}$ lbs.

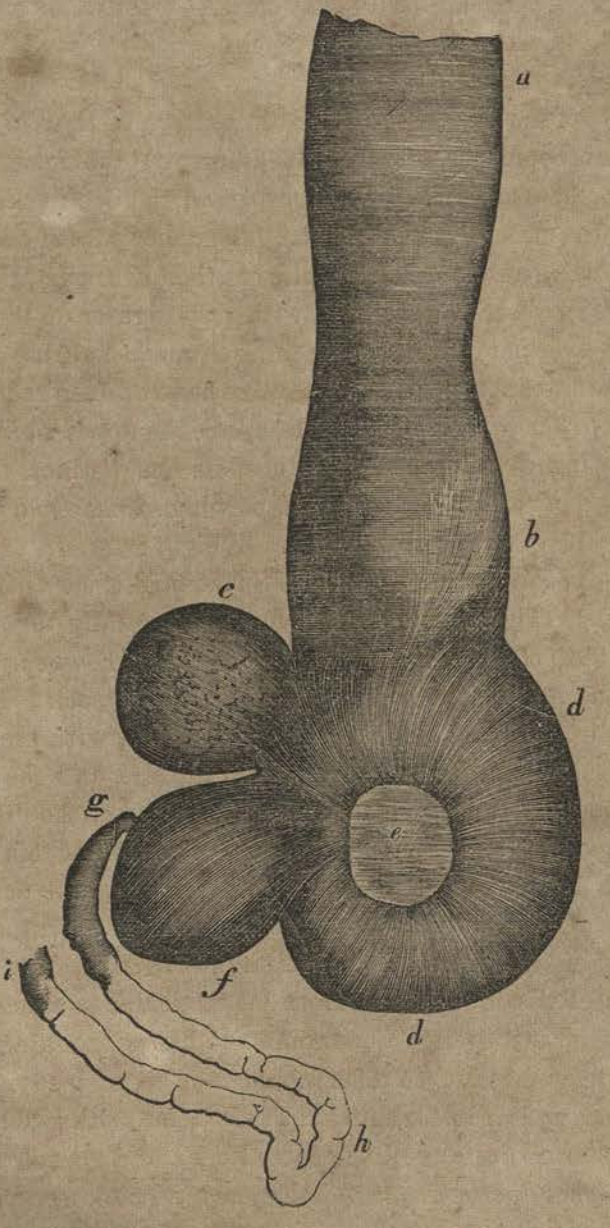
Adult Female.

The female has the plumage similar in texture to that of the male, but only a few inconspicuous elongated feathers on the neck. The bill is lighter than in the male, the naked part around the eye darker, the eye and gular sac as in the male; as are the feet. The upper part of the head and the hind neck are dull greenish-brown, lighter at the lower part, the fore part of the neck is pale reddish-brown, tinged with grey, lighter on the throat; this colour extends over part of the breast, an inch and a half beyond the carpal joint, and terminates abruptly in a transverse band of deep reddish-chestnut; the rest of the lower parts as in the male, as are the upper, only the fore part of the back is tinged with brown, and its spots less distinct.

Length to end of tail 34 inches, to end of wings 29¼, to end of claws 27½; to carpal joint 16¼; extent of wings 43. Weight 2 lbs. 15 oz.

In external appearance and habits the Snake-bird is very nearly allied to the Cormorants. The structure of the feet is essentially the same in both genera, as is that of the wings and tail, the latter however being more elongated in the Anhinga, in correspondence with the neck. If one might suppose a small Cormorant elongated and attenuated, with the feet rather enlarged but shortened, the head diminished in size, and the bill formed more on the model of that of a Heron, being destitute of the distinct ridge and curved unguis, he would form a pretty correct notion of this bird. Not only is the bill like that of a Heron, but the vertebræ of the neck are very similar to those of that family, and form the same abrupt curvatures between the seventh and eighth vertebræ. But all the other bones are those of the Cormorants and Pelicans. The sternum in particular is almost precisely similar to that of the Crested Cormorant, so that without entering very minutely into its description, no differences could be pointed out.

Both mandibles are concave within; the palate flat, with two longitudinal ridges; the posterior aperture of the nares linear and 9 twelfths long, the anterior or external aperture *entirely obliterated.* The lower mandible has a distinct oblique joint at about a third of its length, enabling it to be expanded to the extent of an inch and a half. The pouch, which is small, is constructed in the same manner as that of the Pelicans and Cormorants; its muscular fibres running from the lower edge of the mandible downwards and backwards, and a slender muscle passing from the anterior part of the hyoid bone to the junction of the crura of the mandible. The tongue is reduced to a more oblong knob, 1½ twelfths long, and ½ twelfth in height. The aperture of the glottis is 3 twelfths long, with two roundish thin edged flaps behind, destitute of papillæ. There is a small bone appended to the occipital ridge, ¼ inch in length, as in the Cormorants.



The œsophagus, *a b*, is 17 inches long, exceedingly delicate and dilatable, with external longitudinal fibres, the transverse fibres becoming stronger towards the lower parts. Its diameter when moderately dilated is $1\frac{3}{4}$ inches at the top, 1 inch farther down, at its entrance into the thorax, 9 twelfths, and finally $1\frac{1}{2}$ inches; but it may be dilated to a much greater extent. *The proventricular glands, instead of forming a belt at the lower part of the œsophagus, are placed on the right side in the form of a globular sac*, about an inch in diameter, communicating with the œsophagus, *b*, and stomach, *d*. For two inches of the lower part of the œsophagus, *b*, or at that part usually occupied by the proventriculus, the transverse muscular fibres are enlarged,

and form an abrupt margin beneath; on the inner surface there are four irregular series of large apertures of gastric glandules or crypts. The pro ventriculus itself, *c*, is composed of large crypts of irregular form, with very wide apertures, and covered externally with muscular fibres. The stomach, *d d*, is roundish, about an inch and three quarters in diameter, with two roundish tendinous spaces, *e*, and fasciculi, of muscular fibres; its inner coat thin, soft, and smooth. It opens by an aperture a quarter of an inch in diameter into a small sac, *f*, precisely similar to that of the Pelican, which has a muscular coat, with a soft, even, internal membrane, like that of the stomach. The pylorus has a diameter of 2 twelfths, is closed by a semilunar valve or flap, and is surrounded by a disk of radiating rugæ three-fourths of an inch in diameter. The intestine, *g h*, is 3 feet 4 inches long, its average diameter 2½ twelfths, but only 1 twelfth at its junction with the rectum, which is 3½ inches long, 3 twelfths in diameter. The cloaca globular, 1½ inches in diameter. There are *no cæca*, properly so called, but a *small rounded termination of the rectum*, 2 twelfths in length, as in the Herons.

The subcutaneous cellular tissue is largely developed, and the longitudinal cells on the neck are extremely large, as in Gannets and Herons. The olfactory nerve is of moderate size, and the nasal cavity is a simple compressed sac 4 twelfths in its greatest diameter. The external aperture at the ear is circular, and not more than half a twelfth in diameter.

The trachea is 13½ inches long, much flattened, narrow at the upper extremity, where it is 2½ twelfths in breadth, enlarging gradually to 4½ twelfths, and toward the lower larynx contracting to 2½ twelfths. The rings are very slender, unossified, and feeble; their number 230; the bronchial half-rings 25. The contractor muscles moderate; sterno-tracheales; and a pair of inferior muscles going to the last ring.

In a young bird scarcely two days old, and measuring only 3¾ inches in length, the two most remarkable circumstances observed refer to the nostrils and stomach. The posterior or palatal aperture of the nares is of the same form, and proportional size, as in the adult; the nasal cavity is similar; but there is an external nasal aperture, or nostril, on each side, so small as merely to admit the mystachial bristle of a Common Squirrel. The stomach is of enormous size, occupying three-fourths of the cavity of the thorax and abdomen, being 10 twelfths of an inch long, and of an oval shape. The proventriculus is separated from the stomach and formed into a roundish lobe, as in the old bird; and beside it is the lobe or pouch appended to the stomach, and from which the duodenum comes off. Even at this very early age, the stomach was turgid with a pultaceous mass apparently composed of macerated fish, without any bones or other hard substances intermixed.

END OF THE SIXTH VOLUME.

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